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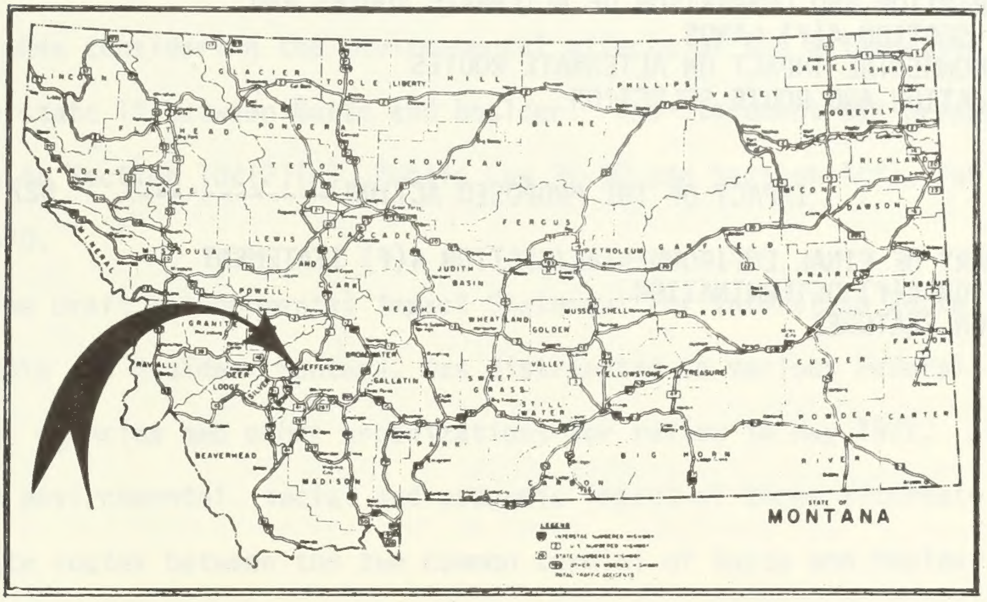
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
AND
STATE OF MONTANA
DEPARTMENT OF HIGHWAYS

FINAL
ENVIRONMENTAL SECTION 4 (f) STATEMENT

Administrative Action
FOR
PROJECT I 15-2(23); I 15-3(10), (11), (12), (13), (2) between
Butte and Boulder, Montana, in Jefferson and Silver Bow Counties.



THIS HIGHWAY IMPROVEMENT IS PROPOSED FOR FUNDING UNDER TITLE 23, U.S.C.
THIS STATEMENT FOR THE IMPROVEMENT WAS DEVELOPED IN CONSULTATION WITH
THE FEDERAL HIGHWAY ADMINISTRATION AND IS SUBMITTED PURSUANT TO:

42 U.S.C. 4332(2)(C) & 49 U.S.C. 1653(f)

Date Oct. 18, 1973 H.J. Anderson, Director
of Highways

By
Administrator, Engineering
Division

APPROVED AND ADOPTED BY THE F.H.W.A.

Date__________ By ____________________
F.H.W.A. REGIONAL
ADMINISTRATOR

SUMMARY OF CONTENTS

Page

INTRODUCTION -- iii

MAPS SHOWING ALTERNATE ROUTES ------------------------------- ix to xi

PHASE I ROUTE SELECTION -------------------------- 1 to 524

DESCRIPTION AND COMPARISON OF ALTERNATE ROUTES AND SECTION 4(f) LANDS
ENVIRONMENTAL IMPACT ON ALTERNATE ROUTES
EVALUATION AND ROUTE SELECTION

PHASE II IMPACT OF THE PROPOSED ACTION ----------- 527 to 591

SUMMARY OF FINAL ENVIRONMENTAL/SECTION 4(f) STATEMENT
SECTION 4(f) DETERMINATION
DESIGN FEATURES

INTRODUCTION

This Statement has been prepared to assure that the human environment is carefully considered and that National and State environmental goals are met when considering the environmental effects of the alternative routes for Interstate 15 between Butte and Boulder. The Statement was prepared pursuant to Section 102(2)(c), Public Law 91-90 and Section 4(f), Public Law 89-670.

The Draft Environmental Impact Statement for Interstate Route 15 between Butte and Boulder, Montana, was distributed to various Federal, State and local agencies and other organizations for review in May 1972. It evaluated the environmental, social and economic impact of three alternate 4-lane Interstate routes between the two common termini of Butte and Boulder. The three alternates studied were the Basin route, the Nez Perce route, and the Whitetail route. The comments generated by these reviews and by the public hearings held on June 28 and 29, 1972, brought out, among other things, the need for a more comprehensive study of the effect on the human environment of these alternates. It also brought out the need for study of one additional alternate, the Boulder Valley route.

As a result, the firm of Wirth Associates, Environmental Planning Consultants, was retained to increase the scope of the interdisciplinary study team. The assessment encompassed in the Environmental Impact/Section 4(f) Statement is based on the varied expertise of Environmental Planners, Engineers, Historians, Geologists, Traffic Specialists, and experts in the fields of socio-economics, hydrology and right-of-way appraisals. Other contributions to this team effort came from experts associated with several State and Federal Agencies. These included the Montana Fish and Game, U.S. Forest Service, Montana Bureau of Mines and Geology, U.S. Soil Conservation Service, U.S. Geological Survey and the Montana Board of Health and Environmental Sciences.

This Final Statement differs in several respects from the draft statement mentioned earlier. It was prepared in two phases. In Phase I each of the four route corridors under consideration was examined by each discipline participating and was evaluated for impact according to the expertise applied to each study subject within that discipline. Each of the four alternate routes was given equal consideration and study, and the resulting impact evaluation summary appearing in Section VII, "Evaluation and Route Section", was developed. Based on the assessment described in Section VII, the conclusion regarding the most desirable route was made.

Phase II of the study consists of a more detailed examination of the chosen alternate route. In this phase, personnel of the various disciplines examined the selected alternate to determine possible measures which could be employed to minimize any undesirable impacts.

In short, Phase I can be considered a route selection study; Phase II could be termed efforts to minimize harm to the environment along the selected route.

IMPACT RATING SYSTEM

Impact generally implies a negative or undesirable effect. Each component of this study has been rated on this basis. The impact rating charts shown in the Evaluation and Route Selection section and elsewhere show only three general ratings - low, medium and high. The charts are to aid the reviewer in that they generally summarize the degree of impact. They are not intended to tell the whole story nor can each subject rating for an alternate route be averaged or totaled to produce an overall rating. The degree of impact in any category is relative only to another rating in that same category for another alternate route.

Also, some duplication of ratings was necessary in order to cover all subjects thoroughly. Physiography, Aesthetics, Geology and even Vegetation generally apply to the appearance of the land. The removal of trees in forming a cut slope would possibly be rated as a severe impact in all four categories. This may tend to overemphasize actual damage.

SUMMARY OF SIGNIFICANT CHANGES FROM THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

For the convenience of those who reviewed the Draft Environmental Impact Statement, the following significant changes between the draft and this Final Impact Statement are listed:

1. The basic study approach is different in that this Final Statement was accomplished in two phases. Phase I included study of all aspects of each of the four alternate routes and resulted in a route selection. Phase II consisted of a detailed study of the selected route and listed possible measures to minimize harm as determined by the interdisciplinary study team.

2. Addition of Alternate Four. As a result of comments received from the public hearings and from reviews of the Draft Statement, the Boulder Valley route was included as a portion of the Phase I study. Aslo included in the study of alternate routes in Phase I was the section of I-90 between Whitehall and Butte which would be used as a common route with I-15 for Alternates 3 and 4.

3. A more extensive and comprehensive use of an interdisciplinary study team was employed. In additon to those who prepared the Draft Statement, environmental planners and historians, and other experts from various public agencies, contributed input to this Final Statement.

4. Traffic Assignment Process. Transportation specialists of the Federal Highway Administration were consulted as to method of approach used to study the traffic assignment and the transportation analysis problem and data from a comprehensive traffic economic analysis is included in this Final Statement. It was determined that the minimum area of influence of

the road user which should be considered in order to properly evaluate effects of all traffic affected, would be as shown on the map entitled, "Area of Study for Traffic Assignment", Figure 7. This map is shown in Section 2, "Highway Economics".

The Montana Department of Highways, Planning and Research Bureau, subsequently assigned traffic volume forecasts to each link of the study network based on existing origin-destination counts taken at various locations within the study area. Maintenance costs for the system were furnished by the Montana Department of Highways, Maintenance Division, and detailed road user operating costs and construction cost estimates were developed by the Engineering Consultant. This total input was then combined to prepare equivalent annual uniform cost figures for each of the four alternate routes.

5. The route length of Alternates 1, 2 and 3, are one-half mile longer than reported in the Draft Statement. It was necessary to move the common point near Boulder to accommodate the added 4th alternate, the Boulder Valley route. This change in length necessarily altered construction cost estimates accordingly.

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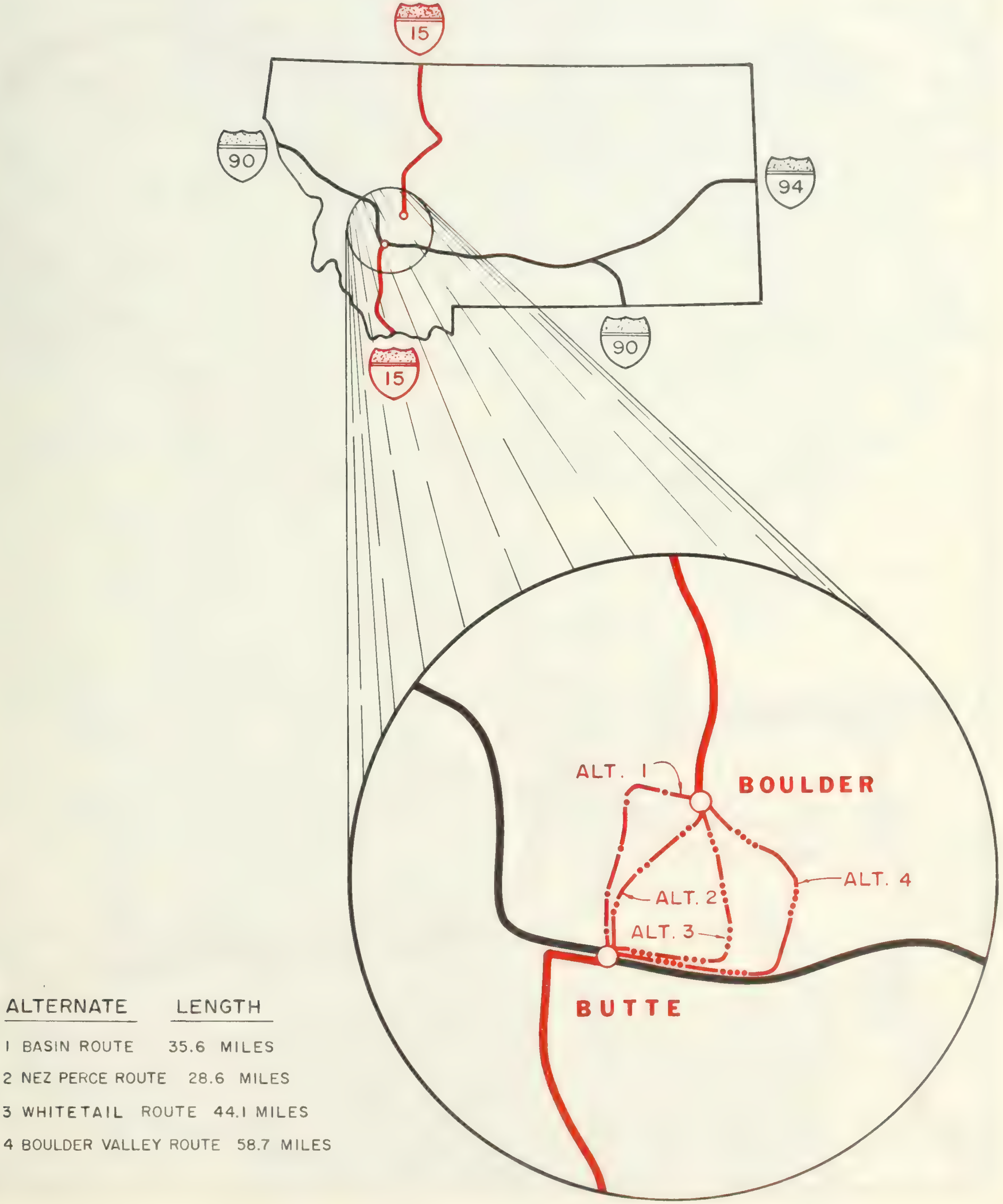
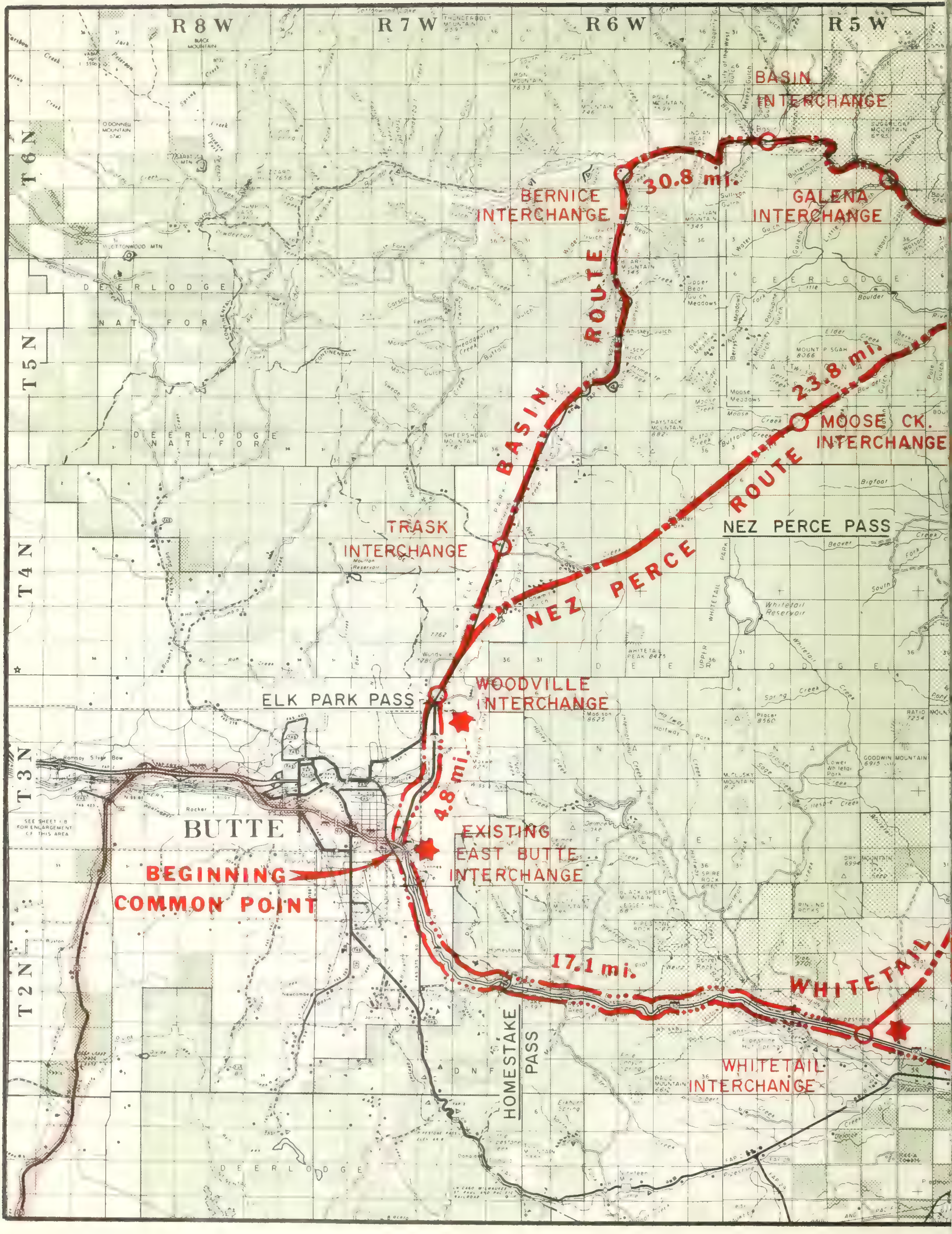
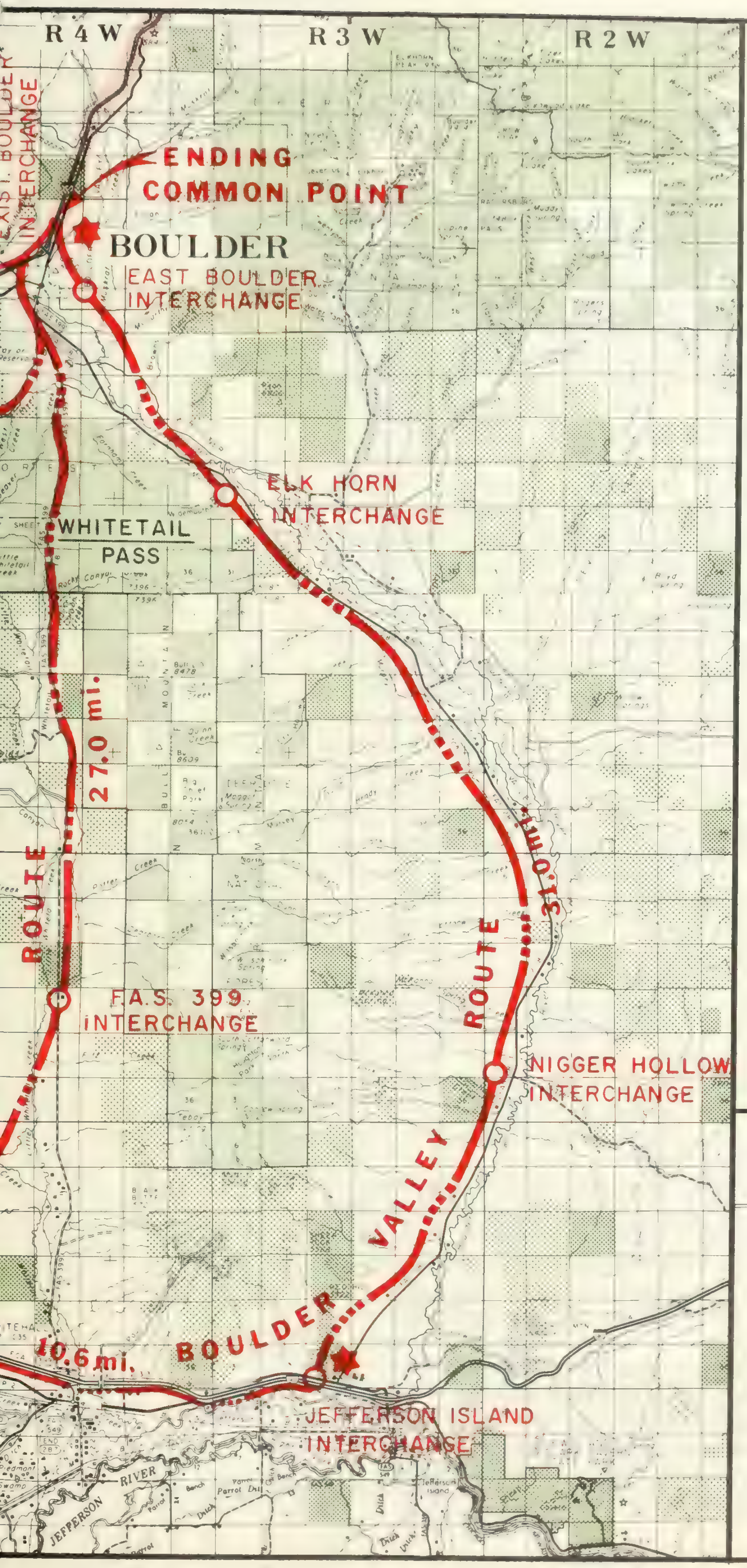
INTERSTATE 15 - BUTTE TO BOULDER



ALTERNATE	LENGTH
1 BASIN ROUTE	35.6 MILES
2 NEZ PERCE ROUTE	28.6 MILES
3 WHITETAIL ROUTE	44.1 MILES
4 BOULDER VALLEY ROUTE	58.7 MILES


R8W
R7W
R6W
R5W
T6N
T5N
T4N
T3N
T2N
BASIN INTERCHANGE
30.8 mi.
BERNICE INTERCHANGE
GALENA INTERCHANGE
BASIN ROUTE
23.8 mi.
MOOSE CK. INTERCHANGE
NEZ PERCE ROUTE
NEZ PERCE PASS
TRASK INTERCHANGE
DEERLODGE NAT FOR
ELK PARK PASS
WOODVILLE INTERCHANGE
4.8 mi.
BUTTE
SEE SHEET I-B FOR ENLARGEMENT OF THIS AREA
EXISTING EAST BUTTE INTERCHANGE
BEGINNING COMMON POINT
17.1 mi.
WHITETAIL
WHITETAIL INTERCHANGE
HOMESTAKE PASS



I-15
BUTTE - BOULDER

STUDY AREA
INDEX MAP

OWNERSHIPS &
ALTERNATE ROUTES

N

LEGEND

🟩	U.S. FOREST SERVICE
▨	U.S. GOV'T. - B.L.M.
▩	STATE OF MONTANA
☐	PRIVATE

SCALE : (IN MILES)

0 1 2 3 4 5

TOTAL ROUTE LENGTHS BETWEEN COMMON POINTS

1 BASIN ROUTE
4.8 + 30.8 = 35.6 MILES

2 NEZ PERCE ROUTE
4.8 + 23.8 = 28.6 MILES

3 WHITETAIL ROUTE
17.1 + 27.0 = 44.1 MILES

4 BOULDER VALLEY ROUTE
17.1 + 10.6 + 31.0 = 58.7 MILES

TABLE OF CONTENTS

Page

TITLE SHEET ---------- i
INTRODUCTION ---------- iii
IMPACT RATING SYSTEM ---------- v
SUMMARY OF SIGNIFICANT CHANGES FROM THE DRAFT STATEMENT ------ vi
STATE SITE MAP ---------- ix
STUDY AREA INDEX MAP ---------- x

PHASE I - ROUTE SELECTION

SECTION I - DESCRIPTION OF ALTERNATES

- FOREWORD ---------- 3
- EXISTING ROAD NETWORK
  - U.S. Highway 91 (Basin) ---------- 4
  - Whitetail Pass Road (FAS 399) ---------- 5
  - Boulder Valley Road (FAS 281) ---------- 6
- ALTERNATE 1 - BASIN ROUTE ---------- 8
- SECTION 4(f) LANDS Along the Basin Route ---------- 10
  - Elk Park Campground ---------- 11
    - Figure 1 Elk Park Campground Sketch ---------- 12
    - Photographs - Elk Park Campground ---------- 13
  - Bison Creek Picnic Area ---------- 14
    - Figure 2 Bison Creek Picnic Area Sketch ----- 15
    - Photographs - Bison Creek Picnic Area ------- 16
  - Shamrock Campground ---------- 17
    - Figure 3 Shamrock Campground Sketch ---------- 19
    - Photographs - Shamrock Campground ---------- 20
- DE FACTO 4(f) LANDS Along The Basin Route ---------- 21
  - Aerial Photographs - Basin Route ---------- 25 to 38
- ALTERNATE 2 - NEZ PERCE ROUTE ---------- 39
- SECTION 4(f) LANDS Along the Nez Perce Route ------- 40
  - Elder Creek Campground ---------- 41
    - Figure 4 Elder Cr. Campground Sketch -------- 43
    - Photographs - Elder Cr. Campground ---------- 44
- DE FACTO SECTION 4(f) LANDS Along the Nez Perce Route 45
  - Figure 5 BLM Recreational Site Sketch ---------- 46
  - Photographs - BLM Recreational Site ---------- 47
  - Aerial Photographs - Nez Perce Route ---------- 49 to 56
- ALTERNATE 3 - WHITETAIL ROUTE ---------- 57
- SECTION 4(f) LANDS Along the Whitetail Route ------- 59
- DE FACTO SECTION 4(f) LANDS Along the Whitetail Route 59
  - Aerial Photographs - Whitetail Route ---------- 61 to 72
- ALTERNATE 4 - BOULDER VALLEY ROUTE ---------- 73
- SECTION 4(f) LANDS Along the Boulder Valley Route -- 74
- DE FACTO SECTION 4(f) LANDS Along the Boulder Valley Route ---------- 74
  - Aerial Photographs - Boulder Valley Route ----- 75 to 91
- ALIGNMENT COMPARISONS OF ALTERNATE ROUTES ---------- 93
  - Table 1 - Summary of Horizontal Curves -------- 93
  - Table 2 - Summary of Profile Grades ---------- 94
  - Figure 6 - Route Length and Profile Grade Comparison ---------- 96 & 97

TABLE OF CONTENTS - Continued

Page

SECTION II - HIGHWAY ECONOMICS
ECONOMIC ANALYSIS OF TRANSPORTATION NETWORK ------------- 101
The Approach -------------------------------------- 101
Table 6 - Traffic Forecast Factors ------------ 102
Figure 7 - Area of Study for Traffic Assignment 103
Table 3 - 1970 Trip Table -------------------- 104 & 105
Table 4 - 1987 Trip Table -------------------- 106
Table 5 - 1997 Trip Table -------------------- 107
Figures 8 thru 12 - 1970, 1987, 1997 Traffic Assignments for Existing Roads & Each Alternate ---------------------------------- 108 to 112
Table 7 - Vehicle Operating Costs ------------ 114
Table 8 - Estimated Capital Construction Costs- 117
Table 9 - Cost of Completion Sections of I-15 - 118
Table 10 - Maintenance Costs ----------------- 119
Table 11 - Service Life of Highway Components - 119
Table 12 - Annual Construction Costs ---------- 120
Figure 13 - Travel Times and Distances -------- 121
Figures 14, 15 & 16 - Summary of Annual Transportation Costs ----------------------- 123 to 125
The Analysis -------------------------------------- 126
The Results --------------------------------------- 128
Impact Evaluation Chart ---------------------- 128
REFERENCES --- 129

SECTION III - ENGINEERING AND THE ENVIRONMENT
INTRODUCTION -- 133
GEOLOGY -- 134
Engineering Geology ------------------------------- 135
Seismic Considerations ---------------------------- 138
Map of Seismic Probability ------------------- 140
Geology Map ---------------------------------- 142 & 143
HYDROLOGY AND STREAM CHANNEL STUDIES ----------------- 145
Basin Route --------------------------------------- 145
Nez Perce Route ----------------------------------- 147
Whitetail Route ----------------------------------- 147
Boulder Valley Route ------------------------------ 148
AIR POLLUTION -- 149
Auto Emissions ------------------------------------ 149
Table 13 - Vehicle Exhaust Emissions ---------- 150
Figure 17 - Vehicle Exhaust Emissions --------- 151
Other Air Contaminants ---------------------------- 152
NOISE LEVELS --- 154
Table 14 - Predicted Noise Levels ----------------- 156
Table 15 - Design Noise Levels -------------------- 157
Table 16 - Noise Standards ------------------------ 158
Table 17 - Measured Noise Levels ------------------ 158
WATER QUALITY --------------------------------------- 159
Basin Route --------------------------------------- 159
Nez Perce Route ----------------------------------- 160
Whitetail Route ----------------------------------- 160
Boulder Valley Route ------------------------------ 160

TABLE OF CONTENTS - Continued

Page

SECTION III - Continued

CLIMATE -- 162
Climate Map --- 164 & 165
SUMMARY OF RATINGS --------------------------------------- 167
Impact Evaluation Chart ----------------------------- 168
APPENDIX TO SECTION III ---------------------------------- 169
Fish Population Study - Boulder River & Bison Creek (Mont. Fish & Game) -------------------------------- 171 to 176
REFERENCES --- 177 & 178

SECTION IV - THE NATURAL ENVIRONMENT

INTRODUCTION

Background -- 181
Acknowledgements ------------------------------------ 181
STUDY PROCEDURE -- 182
Flow Chart -- 184

IMPACT BY TOPIC

Procedure --- 185

Man Made Features

History & Archeology ------------------------- 186
Map 1 --- 192 & 193
Recreation ------------------------------------- 195 to 203
Map 2 --- 206 & 207

Natural Features

Physiography ---------------------------------- 209 to 216
Map 3 -- 218 & 219
Geology --------------------------------------- 221
Map 4 -- 226 & 227
Vegetation ------------------------------------ 229
Map 5 -- 232 & 233
Wildlife & Fisheries ------------------------- 235 to 249
Map 6 -- 252 & 253
Aesthetics ------------------------------------ 255 to 261
Map 7 -- 264 & 265
SUMMARY & CONCLUSIONS ------------------------------------ 267
Overall Impact Summation --------------------------- 268
COMMITMENTS OF RESOURCES (NATURAL ENVIRONMENT) --------- 269
APPENDIX TO SECTION IV ----------------------------------- 273
Agencies & Individuals Contacted ------------------ 274
History and Archeology Report --------------------- 275 to 303
Mont. Fish & Game Report -------------------------- 304 to 326
REFERENCES --- 327 & 328

TABLE OF CONTENTS - Continued

Page

SECTION V - SOCIO-ECONOMIC STUDY

REGIONAL DESCRIPTION OF IMPACT ZONE AND LOCATION OF SOCIAL-ECONOMIC-CULTURAL CENTERS ---- 333

ECONOMIC IMPACTS ON COMMUNITIES

Butte's Culture and Economy ---- 336
Social and Economic Impact on Butte by Alternate Corridors ---- 339
Basin's Culture and Economy ---- 340
Social and Economic Impact on Basin by Alternate Corridors ---- 342
Boulder's Culture and Economy ---- 343
Social and Economic Impact on Boulder by Alternate Corridors ---- 345
Helena's Culture and Economy ---- 346
Impact on Helena by Alternate Corridors ---- 347

ECONOMIC IMPACTS BY CORRIDORS

Basin Route's Economic Systems ---- 348
Impact on Basin Route Corridor Economic Systems by Alternates ---- 353
Nez Perce's Economic Systems ---- 354
Impact on the Nez Perce Corridor Economic Systems by Alternates ---- 358
Whitetail Pass's Economic Systems ---- 359
Impact on the Whitetail Pass Corridor Economic Systems by Alternates ---- 362
Boulder Valley's Economic Systems ---- 363
Impact on the Boulder Valley Corridor Economic Systems by Alternates ---- 366
Land Ownership Map ---- 368 & 369
TAXABLE VS. NON-TAXABLE LANDS BY CORRIDOR ---- 371
Agriculture Map ---- 372 & 373

SOCIAL IMPACT BY CORRIDORS

Social Systems of Basin Corridor ---- 375
Impacts on Basin Social Systems ---- 378
Social Systems of Nez Perce Corridor ---- 378
Impacts on Nez Perce Social Systems ---- 379
Social Systems of Whitetail Pass Corridor ---- 379
Impacts on Whitetail Pass Social Systems ---- 380
Social Systems of Boulder Valley Corridor ---- 380
Impact on Boulder Valley Social Systems ---- 381
SUMMARY & CONCLUSIONS ---- 383
APPENDIX TO SECTION V ---- 386 to 398
REFERENCES ---- 399 & 400

SECTION VI - PUBLIC INVOLVEMENT

PUBLIC OPINION ---- 403
Organizations & Individuals Supporting Basin Route ---- 404 - 405
Organizations and Individuals Supporting Nez Perce Route ---- 405
Organizations and Individuals Supporting Whitetail Route ---- 405

TABLE OF CONTENTS - Continued

Page

SECTION VI - Continued

Organizations and Individuals Supporting Boulder Valley Route -- 405
SUMMARY OF COMMENTS TO THE DRAFT ENVIRONMENTAL IMPACT STATEMENT -- 406 to 412
RESPONSE TO COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT -- 413 to 416
APPENDIX TO SECTION VI ---------------------------------- 417
Letters Supporting Basin Route -------------------- 418 to 460
Petitions -- 461 to 467
Letters of Comment on Draft Environmental Impact Statement ---------------------------------- 468 to 501

SECTION VII - EVALUATION AND ROUTE SELECTION

IMPACT EVALUATION SUMMARY ------------------------------ 505
Impact Evaluation Summary Chart ------------------- 506
COMPARISON OF DETERMINANTS ----------------------------- 507
A. Highway Economics ---------------------------- 507
B. Engineering and the Environment --------------- 508
C. The Natural Environment ---------------------- 509
1. Impacts of Interstate on Four Alternate Routes ---------------------------------- 509
2. Impact of Construction Improvements on Primary and Secondary Highways ----------- 511
D. Socio Economic Study -------------------------- 512
1. Transportation Industry Importance --------- 512
2. Traffic Volumes Affecting Communities ------ 513
3. Right-of-Way Considerations --------------- 513
E. Public Opinion -------------------------------- 514
F. Highway Safety -------------------------------- 514
1. Accident Loss Projection ------------------ 514
2. Alignment Influence ----------------------- 516
3. Route Continuity -------------------------- 517
G. Highway Service to Highway Users -------------- 518
1. Route Length ------------------------------ 518
2. Road User Route Selection ----------------- 518
3. Route Length Convenience ------------------ 520
4. Traffic During Construction --------------- 520
5. Conservation of Energy -------------------- 521
ROUTE SELECTION -- 522

TABLE OF CONTENTS

Page

PHASE II - IMPACT OF THE PROPOSED ACTION

INTRODUCTION -- 527
FINAL ENVIRONMENTAL/SECTION 4(f) STATEMENT SUMMARY ----------- 528 to 531
SECTION 4(f) DETERMINATION ------------------------------------ 532 to 535
IMPACT BY TOPIC
    Socio Economic Activity ---------------------------------- 536
    Railroads and Utilities ---------------------------------- 538
    Conduct & Financing of Government ---------------------- 539
    History and Archeology ----------------------------------- 539
    Pollution -- 540
        Air Quality -- 540
        Noise Levels --- 541
        Water Quality -- 541
    Public Health & Safety ----------------------------------- 542
    Fish and Wildlife -- 543
    Geologic Aspects --- 543
DESIGN FEATURES
    Introduction --- 545
    General -- 546
    Design Details --- 547
        Earthwork -- 550
        Channel Studies -------------------------------------- 551
        Figure 18 - Peak Flow Design Chart ----------------- 552
        Figure 19 - Mean Stream Velocities ----------------- 553
    Possible Modification of Design Details ---------------- 555
    DeJure and DeFacto Recreation -------------------------- 564
    Mitigating Adverse Effects on Fisheries ---------------- 565
    Potential Impact on Historic Sites and Structures ------- 567
    Special Considerations and Techniques------------------- 568
    Construction Guidelines for Environmental Impact Reduction --- 571
    Design Improvements for Environmental Impact Reduction--- 573
        Figures 20 to 27 ------------------------------------ 574 to 581
EFFORTS TO MINIMIZE HARM -------------------------------------- 582
IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES ------ 582
IMPACT ON THE ENVIRONMENT ------------------------------------- 583
ENVIRONMENTAL DAMAGE WHICH CANNOT BE AVOIDED ----------------- 583
ALTERNATIVE ACTIONS AVAILABLE --------------------------------- 584
RELATIONSHIP BETWEEN SHORT TERM USE AND LONG TERM PRODUCTIVITY- 584
SUMMARY OF FINDINGS AND CONCLUSIONS PHASE II ----------------- 585
APPENDIX TO PHASE II -- 587 to 591

PHASE 1

ROUTE SELECTION

CONSIDERATION OF ALTERNATE ROUTES

SECTION I

DESCRIPTION of ALTERNATES

MORRISON-MAIERLE, INC.
Consulting Engineers Helena, Montana

Page

SECTION I - DESCRIPTION OF ALTERNATES

FOREWORD -- 3

EXISTING ROAD NETWORK
  - U.S. Highway 91 (Basin) ---------------------- 4
  - Whitetail Pass Road (FAS 399) ----------------- 5
  - Boulder Valley Road (FAS 281) ----------------- 6

ALTERNATE 1 - BASIN ROUTE ------------------------- 8

SECTION 4(f) LANDS Along the Basin Route ----------- 10
  - Elk Park Campground --------------------------- 11
    - Figure 1 Elk Park Campground Sketch --------- 12
    - Photographs - Elk Park Campground ----------- 13
  - Bison Creek Picnic Area ---------------------- 14
    - Figure 2 Bison Creek Picnic Area Sketch ----- 15
    - Photographs - Bison Creek Picnic Area ------- 16
  - Shamrock Campground -------------------------- 17
    - Figure 3 Shamrock Campground Sketch --------- 19
    - Photographs - Shamrock Campground ----------- 20

DE FACTO 4(f) LANDS Along The Basin Route ---------- 21
  - Aerial Photographs - Basin Route -------------- 25 to 38

ALTERNATE 2 - NEZ PERCE ROUTE --------------------- 39

SECTION 4(f) LANDS Along the Nez Perce Route ------- 40
  - Elder Creek Campground ------------------------ 41
    - Figure 4 Elder Cr. Campground Sketch -------- 43
    - Photographs - Elder Cr. Campground ---------- 44

DE FACTO SECTION 4(f) LANDS Along the Nez Perce Route 45
  - Figure 5 BLM Recreational Site Sketch --------- 46
  - Photographs - BLM Recreational Site ----------- 47
  - Aerial Photographs - Nez Perce Route ---------- 49 to 56

ALTERNATE 3 - WHITETAIL ROUTE --------------------- 57

SECTION 4(f) LANDS Along the Whitetail Route ------- 59

DE FACTO SECTION 4(f) LANDS Along the Whitetail Route 59
  - Aerial Photographs - Whitetail Route ---------- 61 to 72

ALTERNATE 4 - BOULDER VALLEY ROUTE ----------------- 73

SECTION 4(f) LANDS Along the Boulder Valley Route -- 74

DE FACTO SECTION 4(f) LANDS Along the Boulder Valley Route ------------------------------------- 74
  - Aerial Photographs - Boulder Valley Route ----- 75 to 91

ALIGNMENT COMPARISONS OF ALTERNATE ROUTES ---------- 93
  - Table 1 - Summary of Horizontal Curves -------- 93
  - Table 2 - Summary of Profile Grades ----------- 94
  - Figure 6 - Route Length and Profile Grade Comparison ---------------------------------- 96 & 97

DESCRIPTION OF ALTERNATES

FOREWORD

The two common termini used in this 4-lane Interstate route selection study are the East Butte Interchange near Butte to the south, and Boulder to the North. The four alternate route corridors which were studied are shown on the vicinity map and on the Study Area Index Map at the beginning of the report. They are designated as Alternate 1 - Basin Route; Alternate 2 - Nez Perce Route; Alternate 3 - Whitetail Route; and Alternate 4 - Boulder Valley Route. Distances between departure points are shown by stars on the map in addition to a summary of total route lengths between the common points of the East Butte Interchange and Boulder.

Section 4(f) of the National Transportation Act requires that no highway utilize publicly owned lands that are designated for recreational use whether they are of National, State or local significance, unless there is no feasible or prudent alternative to that use. A description of all Section 4(f) lands is included at the end of each route description and other information relative to the requirements of the Act is provided in Phase II of this report in the Section 4 (f) Determination.

A description of the existing road network and of each alternate Interstate 15 route follows. Aerial photography showing a proposed general alignment is included after each route description. The photos of the Basin Route show and identify the Burlington Northern Railroad (B.N.R.R.) from Elk Park to Boulder. The tracks have been removed by the B.N.R.R from Butte to Basin.

Figure 6 showing interstate route length and profile grade comparisons is on page 96 and this is followed by tabular comparisons of total grades and curvature.

These route descriptions and the costs and analyses which are developed later in Phase I of this report are based on preliminary studies. Further detailed design study of any route might reveal the need for additional facilities such as access roads, right-of-way considerations or possibly even the need for additional interchanges. Further study could also reveal the need for alignment changes or the need for the use of a different median design such as independent alignment. It cannot be determined at this time how these changes might effect the cost estimates of any individual alternate.

EXISTING ROAD SYSTEM

Three existing roads in three of the four alternate route corridors presently offer the driver a choice of routes between Butte and Boulder.

U.S. Primary Highway Route 91 through Basin is the most heavily traveled having carried an average of nearly 1100 vehicles per day in 1970. The distance from Butte to Boulder via this road is about 36 miles. The route leads north from Butte for about five miles on a recently constructed section of 2-lane Interstate 15 with 5% grades and flat curvature to Elk Park Pass where it crosses the continental divide at elevation 6,368 feet. This section of road was opened to traffic in 1966 and is in good condition. The old primary then extends continuously to Boulder as a narrow two-lane asphalt-paved highway throughout its length. It continues north for about nine miles through the center of the wide, nearly level mountain meadow known as Elk Park flats to the southern entrance of Bison Canyon. This section has some rolling profile but little curvature and the surface condition is fair to poor.

The next four miles of road follow Bison Canyon which is narrow and steep creating sharp curvature in the 9 to 10 degree range and some 5% and 6% grades. Pavement condition in this area is fair to poor. The route continues northerly for another three miles through a wider canyon section over relatively open rolling hills on good alignment and grade to the old railroad stop known as Bernice, where it turns easterly and follows the Boulder River Canyon for some 15 miles through the one town on this route Basin, and on into the city of Boulder where it connects with the completed four-lane Interstate 15 extending to the north. The grades in this last section are generally less than 2% and the alignment consists of moderate curves with the exception of the areas just west of Basin and about 2 miles east of Basin. Here the road follows narrow canyons with sharp curvature requiring travel speeds under 40 miles per hour. The pavement condition is fair to poor. The road closely follows Bison Creek and the Boulder River along much of its length and a number of camping areas are available along both.

The existing Whitetail Pass route from Butte to Boulder follows 4-lane Interstate 90 south and east from Butte crossing the continental divide over Homestake Pass at elevation 6,375. The alignment over the divide includes grades up to 6% and a number of curves in the 5 and 6 degree range which results in some Interstate sections which are in the 50 to 60 mile per hour design speed category. About five miles west of Whitehall the route leaves I-90 and turns north and from here follows Federal Aid Secondary road 399 (FAS 399) north through the wide dry grasslands of the Whitetail valley for about 19 miles to where it crosses Whitetail Pass at elevation 5,730 feet Grades for about four miles on either side of the pass exceed 5% and the curvature restricts speed to as little as 25 miles per hour. This is a mountainous area though no major streams are present here. The road then leaves the canyon and crosses low rolling hills to connect with I-15 at Boulder. FAS 399 is a narrow gravel surfaced road in fair condition and the 1970 traffic volume was 112 vehicles per day. The distance from Butte to Boulder via this route is about 48 miles.

This gravel road passes through the wide Whitetail valley grasslands and near several ranches. Whitetail and Little Whitetail Creeks flow down this valley but are a half mile distant from the road in many areas. The mountains near Whitetail Pass are lightly forested and there are no camping facilities available directly from this route.

The existing Boulder Valley road is a third route available from Butte crossing the continental divide at Homestake Pass on some 50 to 60 mile per hour design alignment with 5 and 6% grades and 5 and 6% curves and continuing on to Whitehall. Here the route leaves the Interstate and follows an existing asphalt paved two-lane frontage road easterly to a point near the town of Cardwell. The distance from Butte to Cardwell is about 28 miles. It then follows paved existing two-lane Highway (FAS 281) north through the lower Boulder River Valley for about 33 miles to the city of Boulder. The entire valley is open and grass covered and contains several ranches with their attending hay meadows. The grades and curvature are flat and the asphalt pavement condition is good to fair with the exception of one area south of Boulder which is in poor condition. The entire route is conducive to fairly high speed travel in excess of 50 miles per hour even though the road is relatively narrow with no shoulders.

The distance from Butte to Boulder via this route is about 61 miles. There are no public camping facilities immediately adjacent to this route.

ALTERNATE 1 - BASIN ROUTE.

The routing of this alignment would begin at the East Butte Interchange, the common point, near Mile 130 on Interstates 15 and 90 and would follow the existing constructed two-lane Interstate 15 (I-15) north for about five miles climbing on grades, some of which are 5%, and on nearly tangent alignment to cross the continental divide at Elk Park Pass (elevation 6,368) near Mile 134. The additional two lanes would be constructed parallel to the existing lanes with 150 feet between the centerlines of lanes to make this a four lane facility as the entire I-15 route would be. The alignment would then generally parallel the existing US 91 alignment across the open grasslands of Elk Park Flats for about 10 miles to the south entrance of Bison canyon at Mile 143.5. The alignment in this section would be essentially tangent with flat grades and the opposing pairs of lanes would be parallel with a 100 foot distance between centerlines to provide a standard wide median highway.

One interchange would be provided near Mile 134.5 (called the Woodville Interchange) and the Trask Interchange would be built near Mile 139. The interchanges and remaining U.S. 91, and the connecting frontage roads would provide access to this area.

Near Mile 143.5 the roadway would enter Bison Canyon. Here the curvature would increase to a maximum of 5 degrees (60 M.P.H. design) at one location and the two pairs of lanes would separate and follow independent alignment along opposite sides of the canyon to Mile 146.5. Between Mile 144 and 145 the canyon is quite narrow and in places Bison Creek would be carried between opposing lanes. In this area the average flow in the creek during the summer months is in the range of 40 to 50 cubic feet per second (cfs). Peak flows may be as high as 600 cfs.

At Mile 146.5 the lanes would converge to form a narrow median section with median barrier and would descend on a 5% grade along the side hill to the lower elevation of the canyon bottom near Mile 148. Curvature in this section would be moderate. Just ahead of Mile 148 the lanes again would diverge to follow independent alignment as they leave the narrow canyon and follow the rolling foothills along the west side of the valley. Here each pair of lanes would follow a curvilinear alignment on gently rolling grades in the 70 mph design range which continues to Mile 151. The Bernice interchange would be built here to provide access to the upper Boulder River area and to the lands east of the Interstate.

Between Mile 142 and Mile 151 Bison Creek would cross under one or both lanes of the Interstate at thirteen sites in this 9 miles according to preliminary estimates. Culverts would probably be used at most of these locations.

Near Mile 151 the lanes would converge to 100 feet between centers and this design would be used as the route turns easterly and follows the wide valley past Red Rock Creek. Grades would be flat and curvature would be essentially tangent. At Mile 152.5 the canyon narrows and passes a formation known locally as Indian Head Rock. From here the route would continue on to Mile 153.5 where the lanes would converge to a narrow median section as they enter the narrow canyon west of the town of Basin. Grades would be relatively flat (under 2%) and the curvature would reach a maximum of 7 deg. 30 min. near Mile 153.5 to create a section of 50 mph.

design. The narrow median would be carried on through the town of Basin to the interchange location at Mile 156.

The median would widen for a short distance and at Mile 157 would return to the narrow median design to traverse the narrow canyon. Grades would be flat and the curvature to Mile 158.5 would reach 7 degrees 30'. The lanes would widen to 100 foot centers and would continue on with moderate grades and curvature to the Galena Interchange at Mile 160.5 where they would begin to separate for independent alignment. This would continue to Mile 162.5 where they would tie into existing Interstate 15 near Boulder.

In the eleven miles from Mile 151.5 where Bison Creek flows into the Boulder River the river would be carried under the roadway twice in culverts and at seven locations with bridges.

SECTION 4(f) LANDS Along the Basin Route

There are two developed campgrounds and a picnic area within this route corridor in the Deer Lodge National Forest which would be affected by the Basin alternate. They are the Elk Park and Shamrock campgrounds, and the Bison Creek picnic area.

Other U.S. Forest Service campgrounds in the area which are connected by graded roads to the existing highway are the Mormon, Ladysmith, Whitehouse, and Basin Canyon and Lowland campgrounds. These are all located in the upper Boulder River valley west of Bernice with the exception of Basin Canyon which is northwest of Basin and Lowland campground which is located northwest of Trask. The use of these campgrounds would likely increase both during and following construction of the project They would not directly be affected by construction.

The Elk Park Campground is located on public land in Section 21, Township 5 North, Range 6 West, to the south of U.S. Highway 91, approximately 10.5 miles southwest of Basin, Montana (mile 145). It is administered by the U.S. Forest Service. The campground area covers approximately 11 acres and is situated on the lower slopes of the east side of Bison canyon. It is bounded by the existing highway on the west and rather steep mountain slopes to the east. To the north of the campground is a small marsh area located between the existing highway and the canyon slopes to the north. The campground and surrounding area is covered by a moderate to dense stand of timber most of which is lodgepole pine. Bison Creek is across the highway from the campground but is accessible to pedestrian traffic crossing the highway.

The campground is developed to provide 11 camp units, each equipped with a parking spur, picnic table, fireplace and garbage can. Other improvements include central water supply, central pit-type toilets, and surfaced access road. Vehicular access to the campground is directly off the existing highway.

The capacity of the campground is considered by the Forest Service to be 55 people. During the recreation season the average use is at 35% of capacity, with use running to an estimated 80-90% of capacity on weekends and holidays. The Forest Service estimates 25% of this use is made by local people and 75% by travelers from out of the area. The average length of stay is one night by both local and out-of-area travelers.

Construction of the Basin alternate would require taking

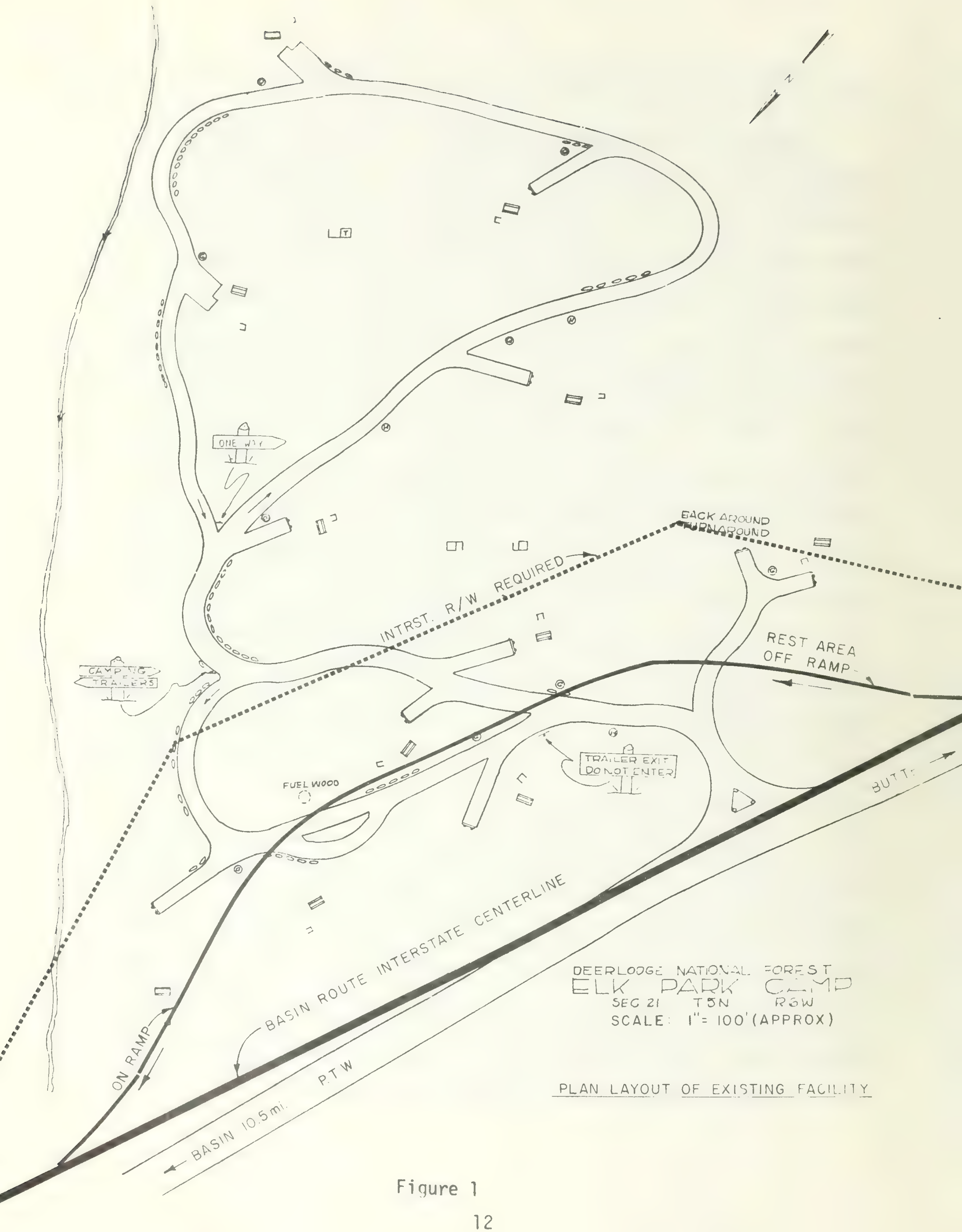

N
ONE WAY
BACK AROUND TURNAROUND
INTRST. R/W REQUIRED
REST AREA OFF RAMP
CAMPING TRAILERS
TRAILER EXIT DO NOT ENTER
FUEL WOOD
BUTT
BASIN ROUTE INTERSTATE CENTERLINE
ON RAMP
P.T.W
BASIN 10.5 mi.
DEERLODGE NATIONAL FOREST
ELK PARK CAMP
SEC 21 T5N R6W
SCALE: 1"= 100'(APPROX)
PLAN LAYOUT OF EXISTING FACILITY

Figure 1

ENTRANCE TO CAMPGROUND
LOOKING SO. FROM HIGHWAY

LOOKING INTO CAMPGROUND
SO. FROM HIGHWAY

VIEW FROM HIGHWAY
LOOKING SOUTHWEST

INSIDE CAMPGROUND
LOOKING NORTH

ELK PARK CAMPGROUND

approximately 2 acres from the northerly side of the campground to accommodate a planned rest area. This would eliminate the present means of access. It is estimated that five camping units would be taken. Loss of access would, in effect, eliminate the use of the remaining area as a campground.

Bison Creek Picnic Area is located near Mile 147.5 on public land in Section 10, Township 5 North, Range 6 West, approximately 8 miles southwest of Basin, Montana, and is administered by the U.S. Forest Service. The area covers 2.4 acres and is situated in a curve between the existing highway on the east and Bison Creek on the west. It is surrounded by Forest Service lands. The existing highway is on the sidehill above and to the east of the picnic area. There are a few trees where improvements are located. The picnic area also has an open, grassy area providing a playground which is bordered by Bison Creek. This provides direct access to the stream. Vehicular access is by a dirt road off the existing U.S. Highway 91 about 0.7 of a mile to the north near Shamrock campground. It runs along the west side of Bison Creek and crosses a bridge into the picnic area. The site is developed to provide 15 picnic units consisting of 8 single-family and 7 multiple-family facilities. The units are equipped with picnic tables, fireplaces or fire-rings and garbage cans. The area is also served by a central water supply, pit-type toilets and the previously described access road. A gravity drinking water fountain is located on the shoulder of the highway above the picnic ground and an unimproved foot path leads to the picnic area for pedestrian access. Camping facilities within the area are not available.

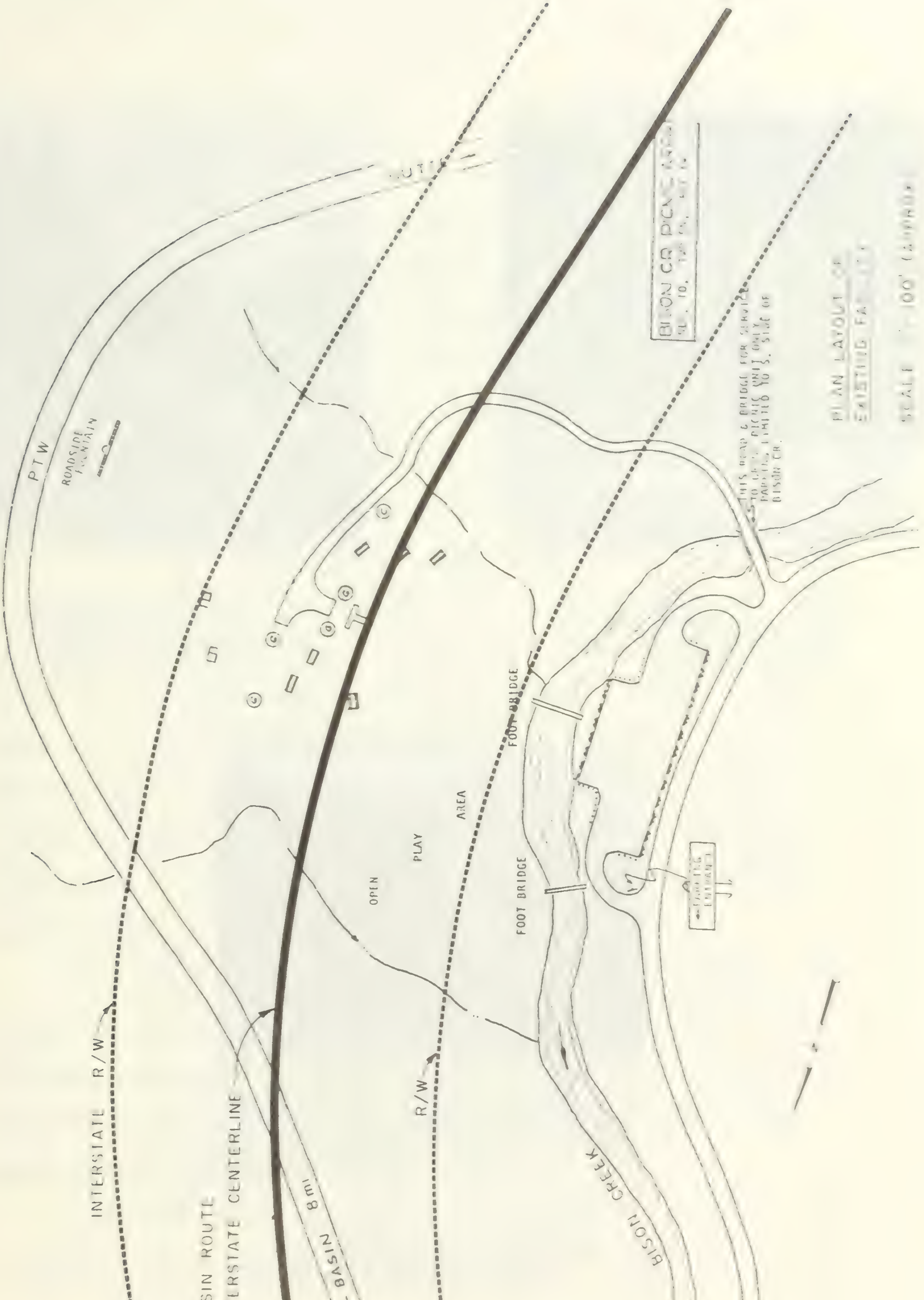

BISON CR PICNIC AREA
PLAN LAYOUT OF
EXISTING FACILITY
SCALE 1" = 100' (APPROX)
THIS ROAD & BRIDGE FOR SERVICE TO CAT. PICNIC UNIT ONLY. PARKING LIMITED TO S. SIDE OF BISON CR.
PTW
ROADSIDE FOUNTAIN
ROUTE
INTERSTATE R/W
BASIN ROUTE
INTERSTATE CENTERLINE
BASIN 8 mi
R/W
OPEN PLAY AREA
FOOT BRIDGE
FOOT BRIDGE
BISON CREEK
PARKING ENTRANCE

Figure 2

VIEW INTO CAMPGROUND
FROM SOUTH

OPEN AREA OF CAMPGROUND
VIEWED NE TO SW

OVERLOOKING CAMPGROUND
FROM HIGHWAY E TO W

BISON CREEK CAMPGROUND

The capacity of the picnic area is 64 people and the average use is reported to be 40% of capacity during the recreation season, with use running to an estimated 80-90% on weekends. 80% of use is by local people and 20% by out-of-area travelers. The average length of stay for both local and out-of-area travelers is one day.

In order to maintain a satisfactory alignment, the Basin Route would necessitate a total take and elimination of this picnic area.

Shamrock campground is located near Mile 148 on public lands in Section 4, Township 5 North, Range 6 West, approximately 7.2 miles southwest of Basin, Montana. It is on the west side of U.S. Highway 91. This campground covers approximately 13 acres and is administered by the U.S. Forest Service. The campground area is bounded by moderately rising slopes on the north, west and southerly sides, which are covered with a moderate stand of timber and brush. Bison Creek crosses the highway immediately south of the campground area and flows generally along the highway east of the campground. Vehicular access is directly off the existing highway.

The campground is developed with facilities to accommodate 7 camp units, with parking spur, picnic tables and benches, fireplace or firering, and a garbage can for each unit. In addition, facilities are provided for 14 picnic units. Access roads, foot bridges, central water supply and pit-type toilets are also provided.

The capacity of this campground is 105 people. The average use is rated at 55% of capacity with use running to an estimated 80-90% on weekends Local use comprises 20% of the use of the campground and out-of-area travelers account for 80% of use. The average length of stay is two nights by local people and one night for out-of-area travelers.

Construction of the Basin alternate would require a taking of about 2 7 acres from the east side of the campground for construction of a planned rest area. No developed portion of the campground would be taken, but the existing access would be removed, thus eliminating the possibility of further use of the remainder as a campground.

In addition to camping and picnicking, these three campgrounds afford opportunities for hiking, sight-seeing, and fishing in the area. There are no planned or organized activities at any of these campgrounds and no permits are needed for their use except for group picnics. Ten to twelve group picnics, averaging about 50 people per group, are held each summer Visitor day-use for individual campgrounds has not been tabulated by the Forest Service, but in 1968, these three campgrounds plus those at Mormon Creek, Ladysmith and Whitehouse, served 10,000 visitors camping and 2,300 picnicking In 1969, they served 6,900 camping and 4,800 picnicking, in 1970 the totals were 8,500 camping and 6,100 picnicking, and in 1971 there were 14,000 campers and 7,300 picnickers.

Five summer homes or cabins along this route now have access from the existing highway Three of these are located in Homesite Gulch at Mile 145.3 on land leased from the Forest Service. The homes and sites would not be encroached upon but the direct access would be terminated Access could be restored to these cabins by constructing an

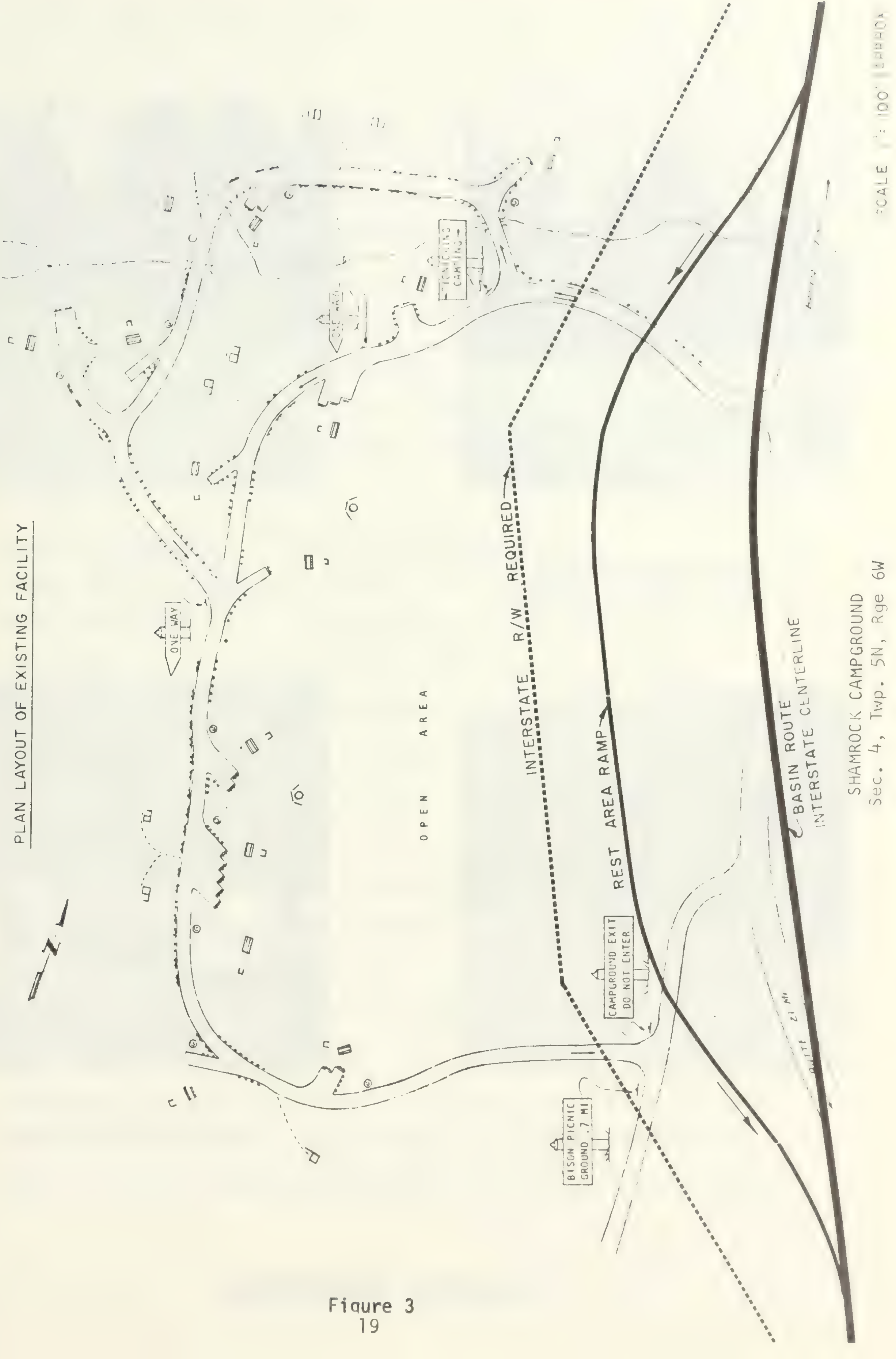

PLAN LAYOUT OF EXISTING FACILITY
N
ONE WAY
ONE WAY
TENTING CAMPING
OPEN AREA
INTERSTATE R/W REQUIRED
REST AREA RAMP
CAMPGROUND EXIT DO NOT ENTER
BISON PICNIC GROUND .7 MI
BASIN ROUTE INTERSTATE CENTERLINE
BUTTE 21 MI
SHAMROCK CAMPGROUND
Sec. 4, Twp. 5N, Rge 6W
SCALE 1"=100' (APPROX)

Figure 3

CAMPGROUND ENTRANCE
LOOKING NO. FROM HIGHWAY

CAMPGROUND VIEWED
FROM SO. LOOKING NORTH

NE LOOKING SWLY

NORTH LOOKING SOUTH

SHAMROCK CAMPGROUND

access road from U.S. 91 at Mile 143.5 and if this were done no relocation would be required. The feasibility of the private access road would be determined at time of R/W negotiation. One summer home is located on private land adjacent to the highway in Section 22, Township 6 North, Range 5 West. This would be taken in construction of the project. The owner has expressed a desire to sell this property to the State. One cabin is located near the Bison Creek Picnic Area. It is anticipated that access would not be perpetuated to this cabin and relocation would be required.

DE FACTO 4(f) LANDS Along the Basin Route

Construction of this alternate would also have an impact on de facto recreational lands. From Mile 143.8 near Elk Park, Bison Creek flows along the existing highway to its confluence with the Boulder River near the planned Bernice interchange. The Boulder River also flows along the highway to the end of this route near the city of Boulder. Most of this section of Bison Creek is located on public lands, the first four miles of which are administered by the U.S. Forest Service. The Montana Department of Highways owns the lands between Mile Posts 148.5 and 150, a tract approximately 1-3/4 miles in length, in the Bear Gulch area. The Basin Route would cross approximately 1 mile of public land administered by the Forest Service south of the Bernice interchange and some additional land in the vicinity of Indian Head Rock. From the Bernice interchange to approximately 1½ miles east of Basin, this project would be constructed primarily on private lands. Between Basin and Boulder approximately 3 miles of the project would be constructed on public lands administered by the Bureau of Land Management. These lands lie between Mile Post 157 and 161. The private ownerships along this route lie generally along the bottom and lower slopes of the canyon and are bordered on either side by public lands.

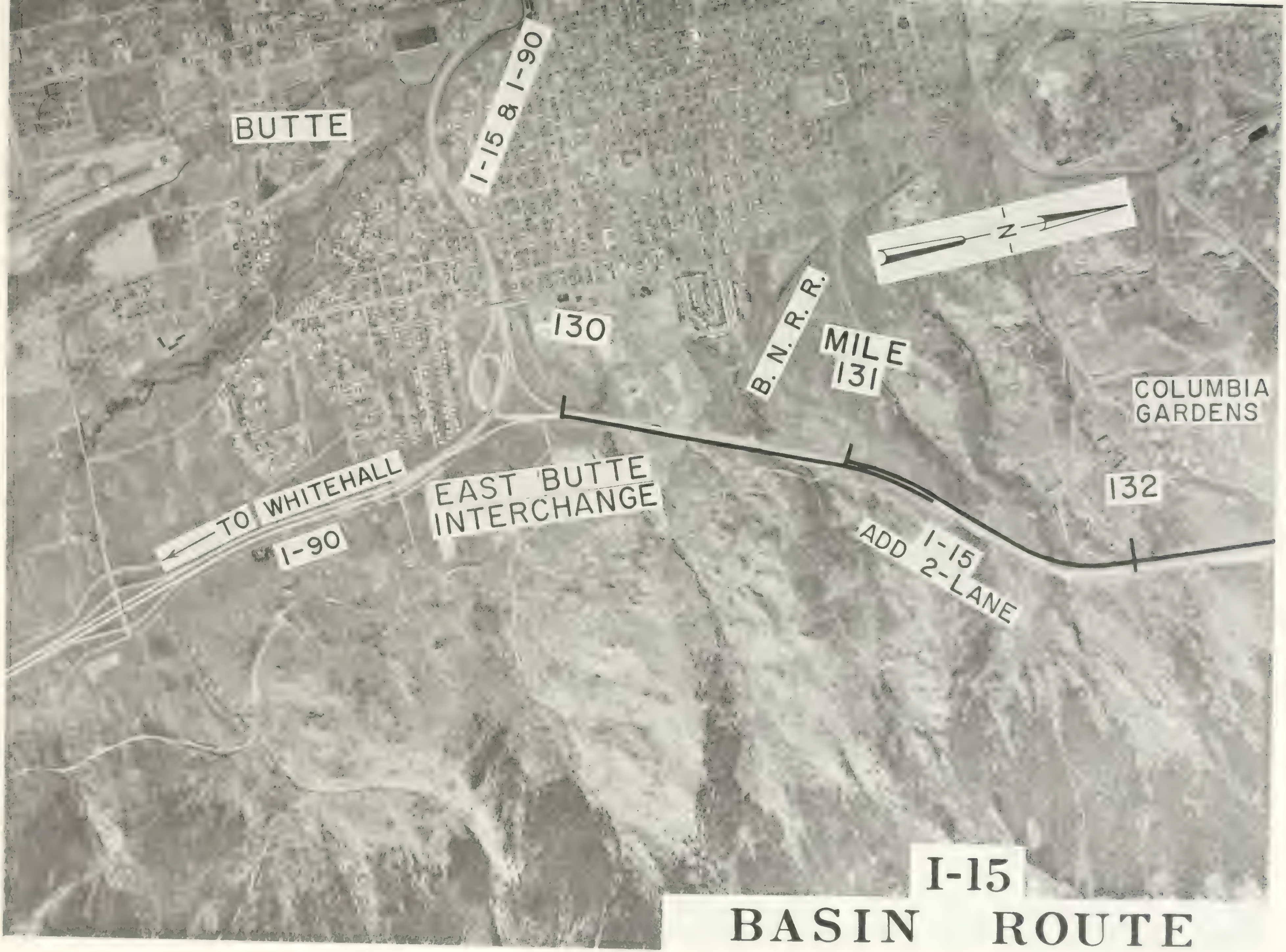
In addition to camping in designated or de jure campground areas there are several de facto recreational use areas which appear to be used quite regularly. These include sites at Mile 145 across the road from Elk Park campground, another near Bernice at Mile 151 and still another at Galena Gulch near Mile 160.5. Some of these are shown on the recreation map on page 207. There are probably other particular areas which get more limited use or have no off-highway parking but are not as easily identified.

Access to most neighboring lands which border on the Basin corridor is presently provided from the existing highway. These areas include but are not limited to such places as Nez Perce and Lowland Creek area, the upper Boulder River from Bernice west and the Bear Gulch area to the east, High Ore and Galena Gulches and to the Basin and Cataract Creek areas. Access to these and most other adjoining areas which may have recreational potential would be provided through the planned system of interchanges and frontage roads. This system includes a low-grade access road, which would also serve as a stock drive lane. It would be required between the Bernice interchange and the Town of Boulder and would be located adjacent to the Interstate throughout most of its length.

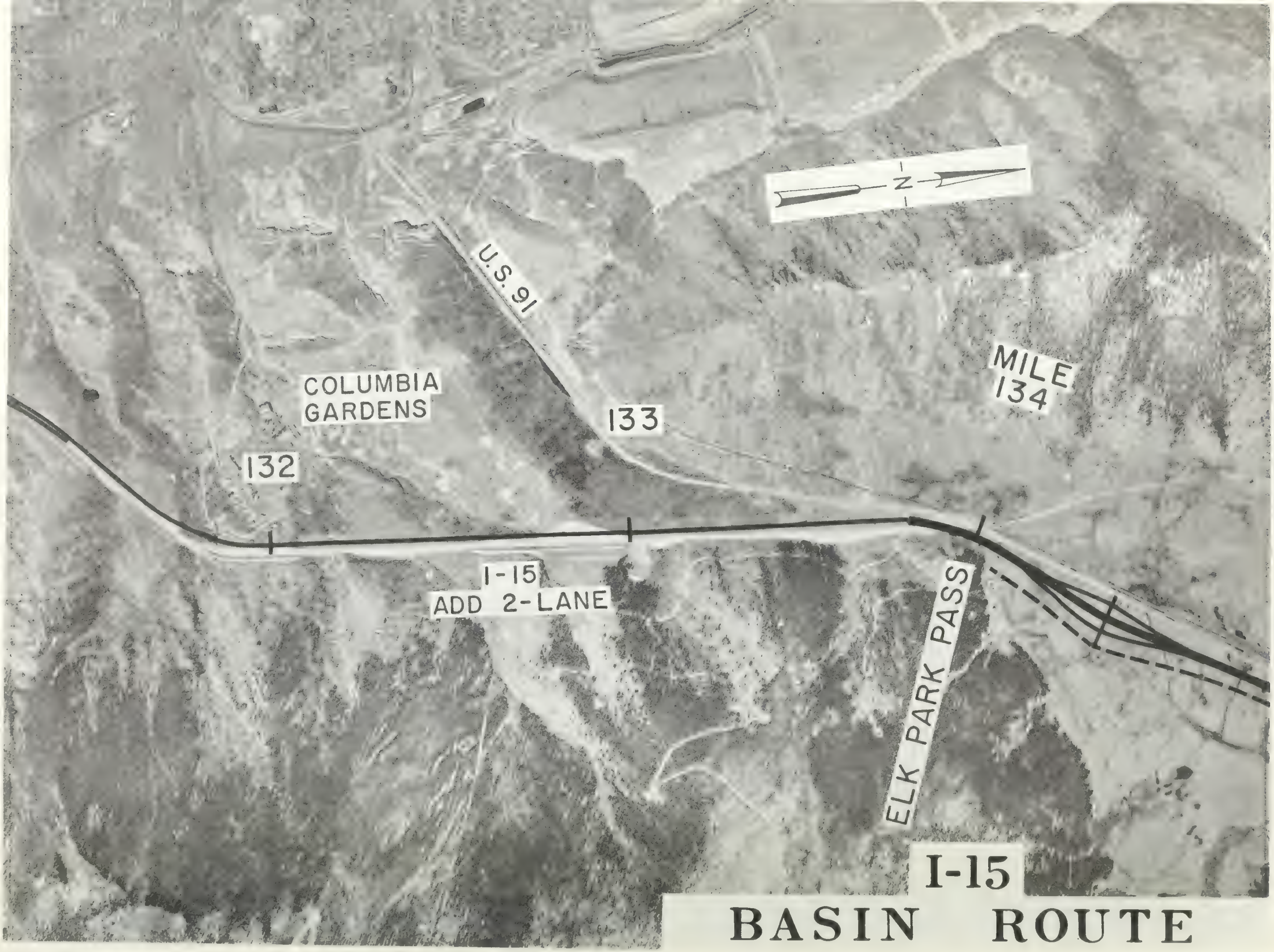
The existing highway also affords pedestrian access for fishing in Bison Creek and the Boulder River, and for hunting and site-seeing. In many places, this necessitates parking on the shoulder of the existing highway which creates a safety hazard since the highway is narrow with many curves and affords poor sight distance.

The whole extent of public lands bordering the highway has some potential for de facto use in that it is not now subject to full control of access. Many areas are and would be subject to limited public use due to steep existing ground slopes along the highway.

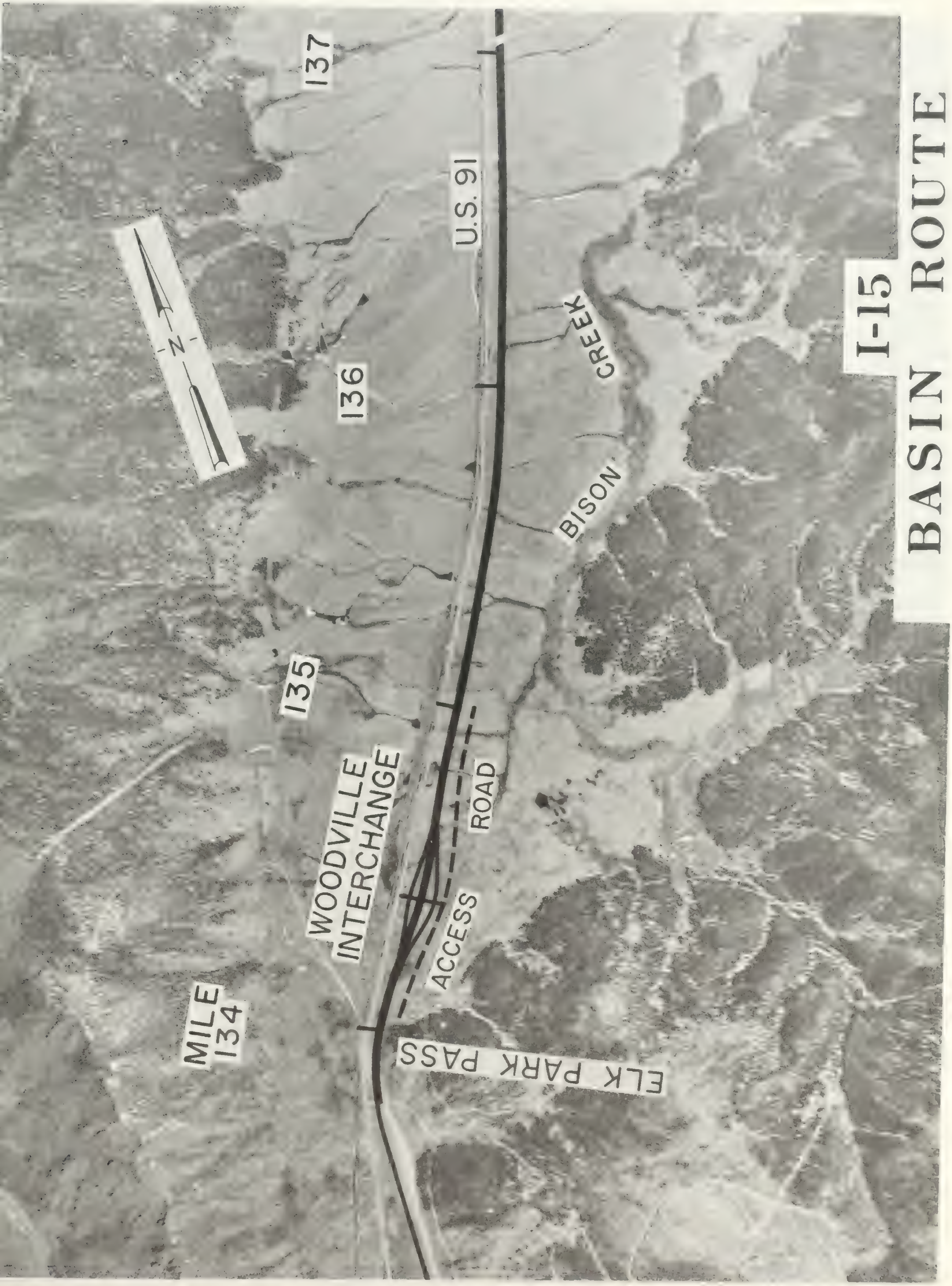
The Interstate would eliminate the random access which now exists to areas adjacent to the highway. Future access would be limited to areas which could be reached on roads or trails for pedestrian or vehicular traffic originating either at the proposed rest areas near the Elk Park and Shamrock campgrounds, or at one of the five proposed interchanges.



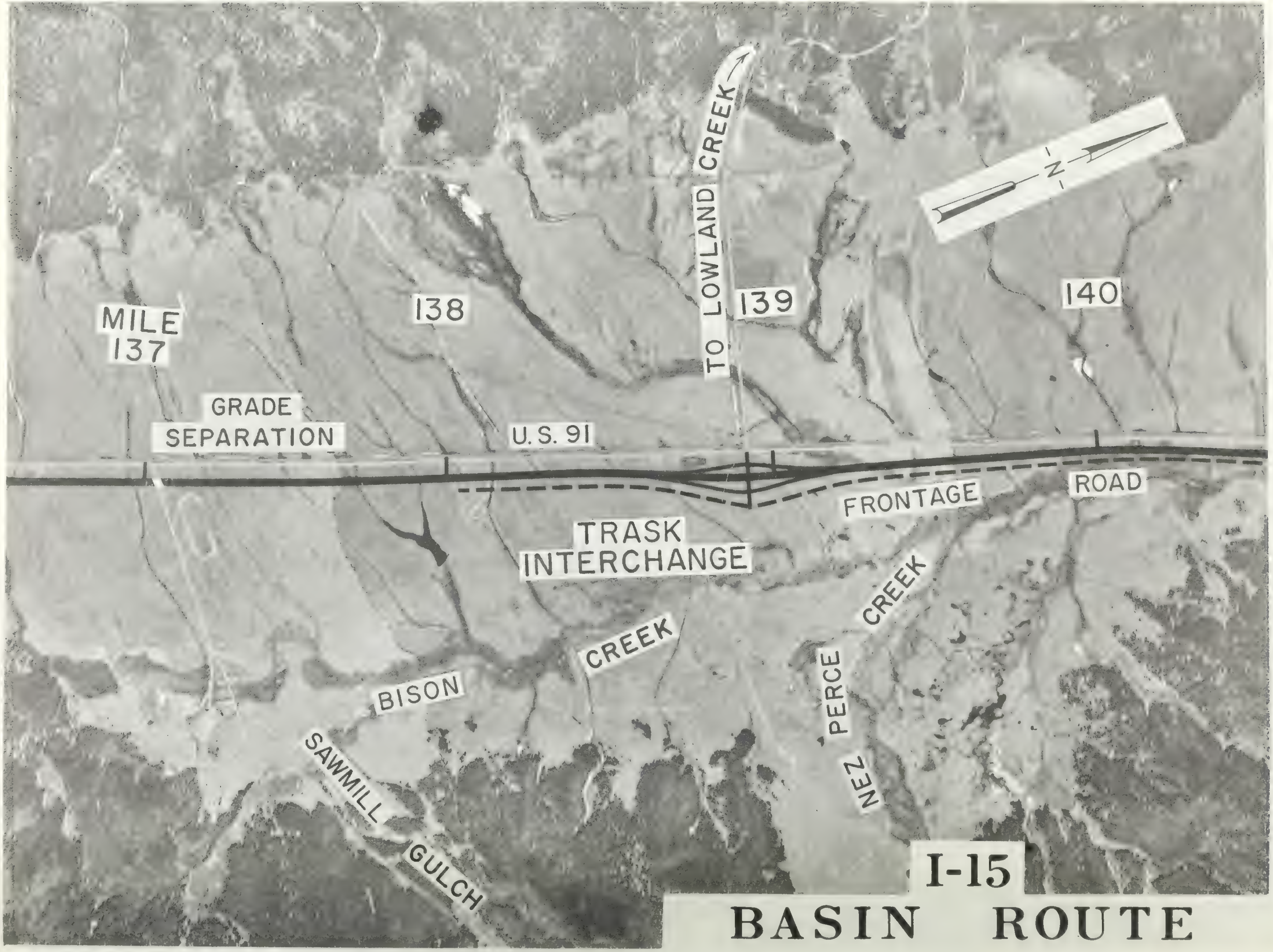
I-15
BASIN ROUTE



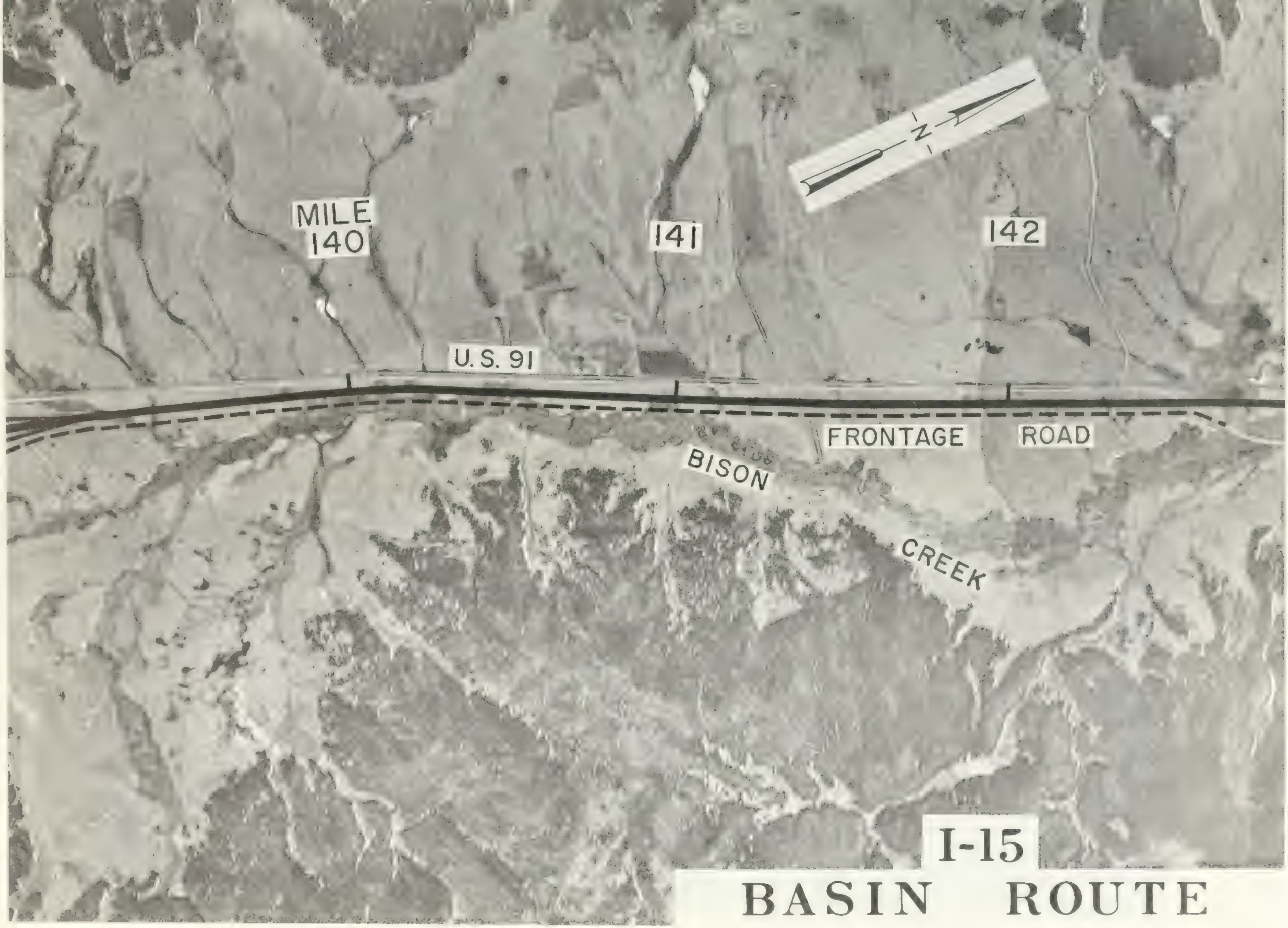
I-15 BASIN ROUTE



I-15 BASIN ROUTE

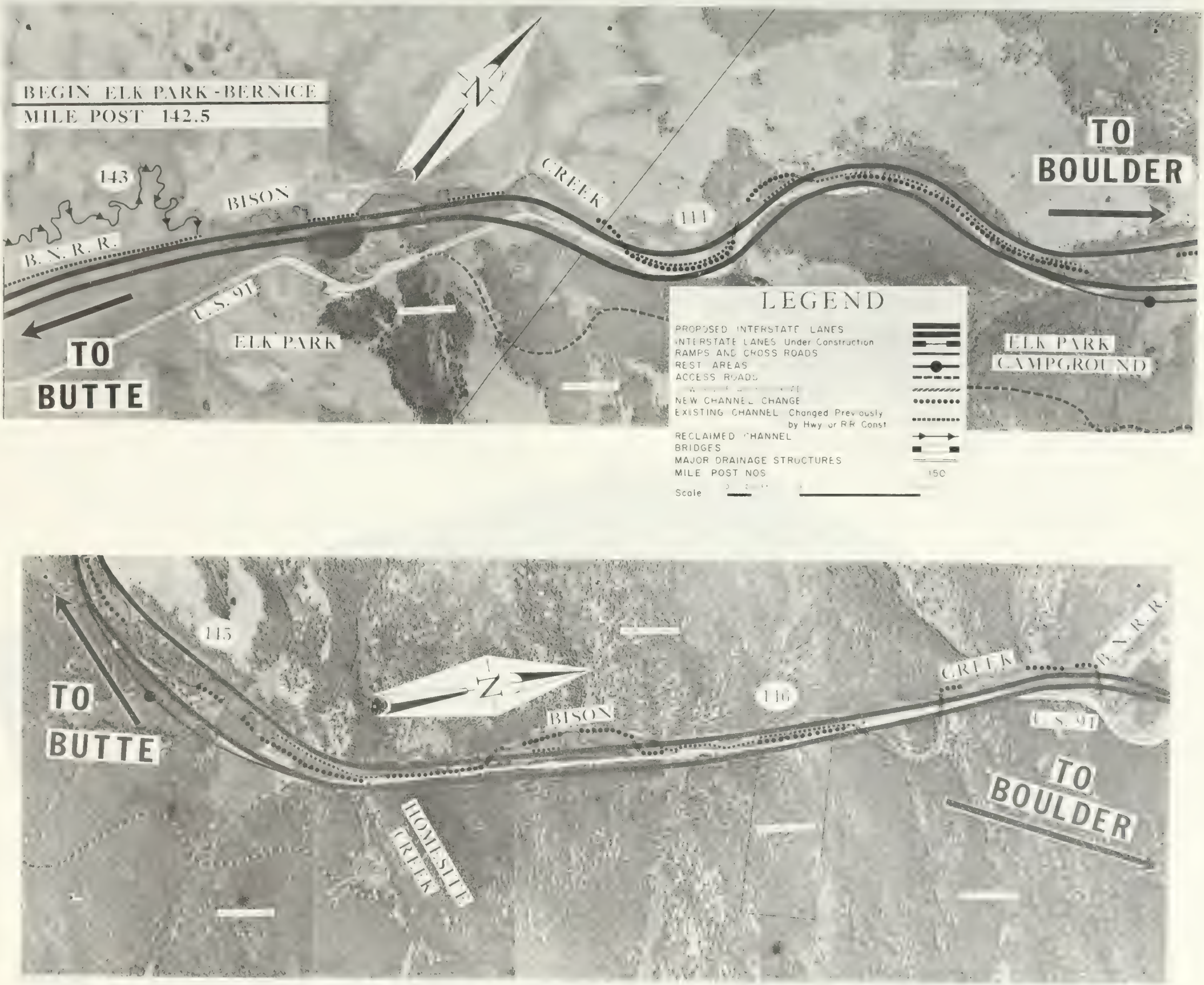


I-15
BASIN ROUTE

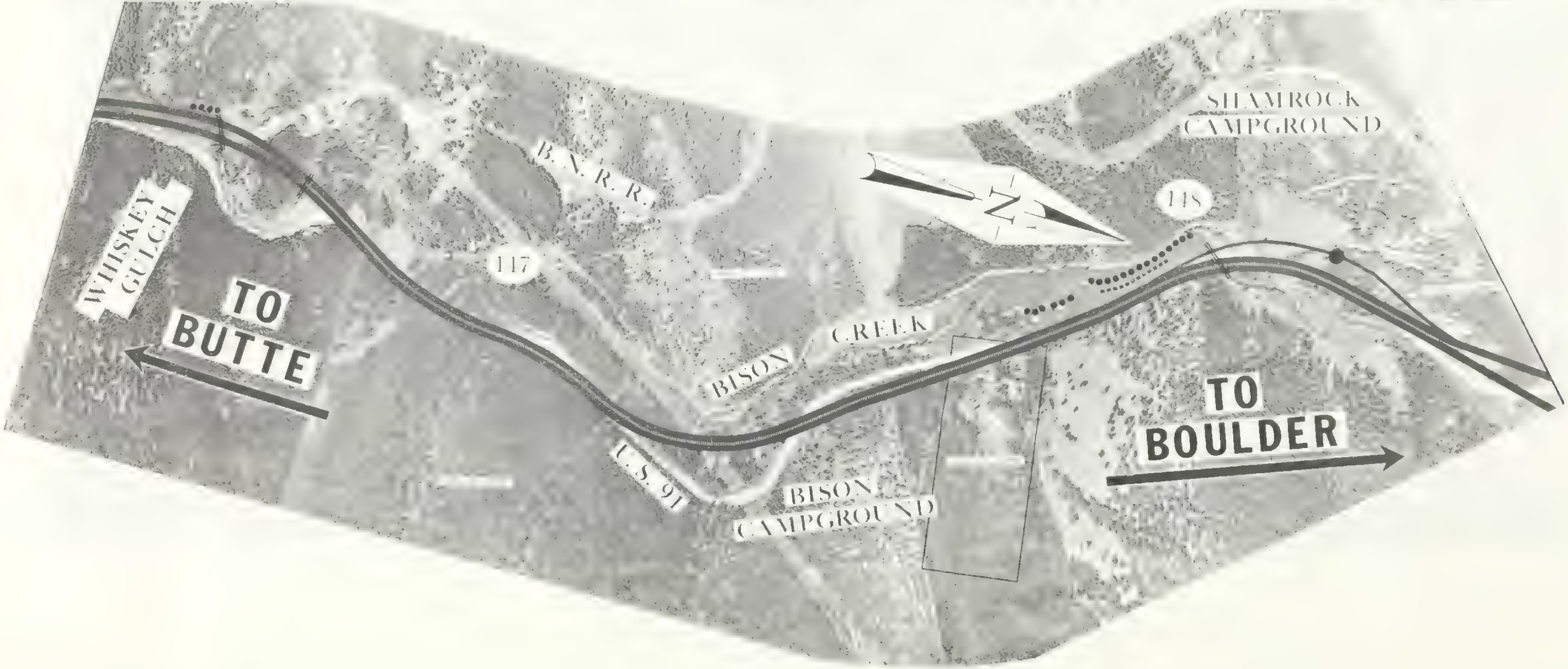


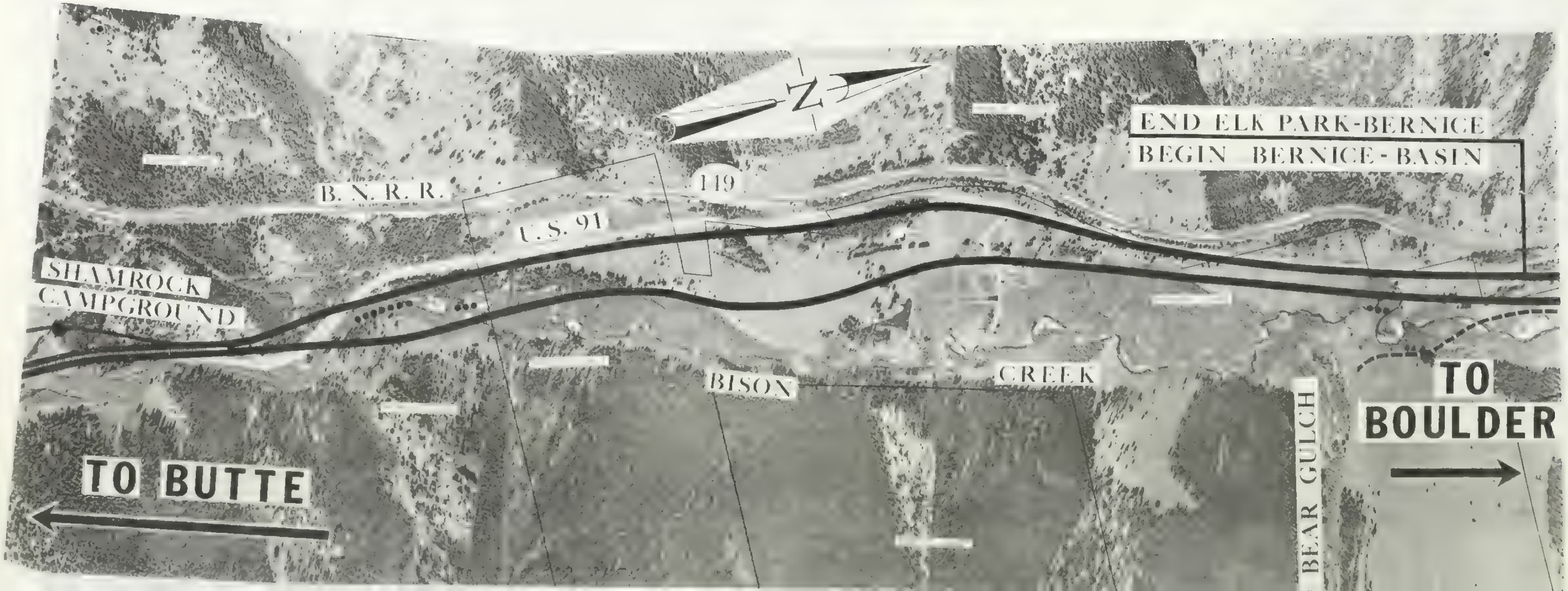
I-15
BASIN ROUTE

INTERSTATE 15 ELK PARK - BERNICE

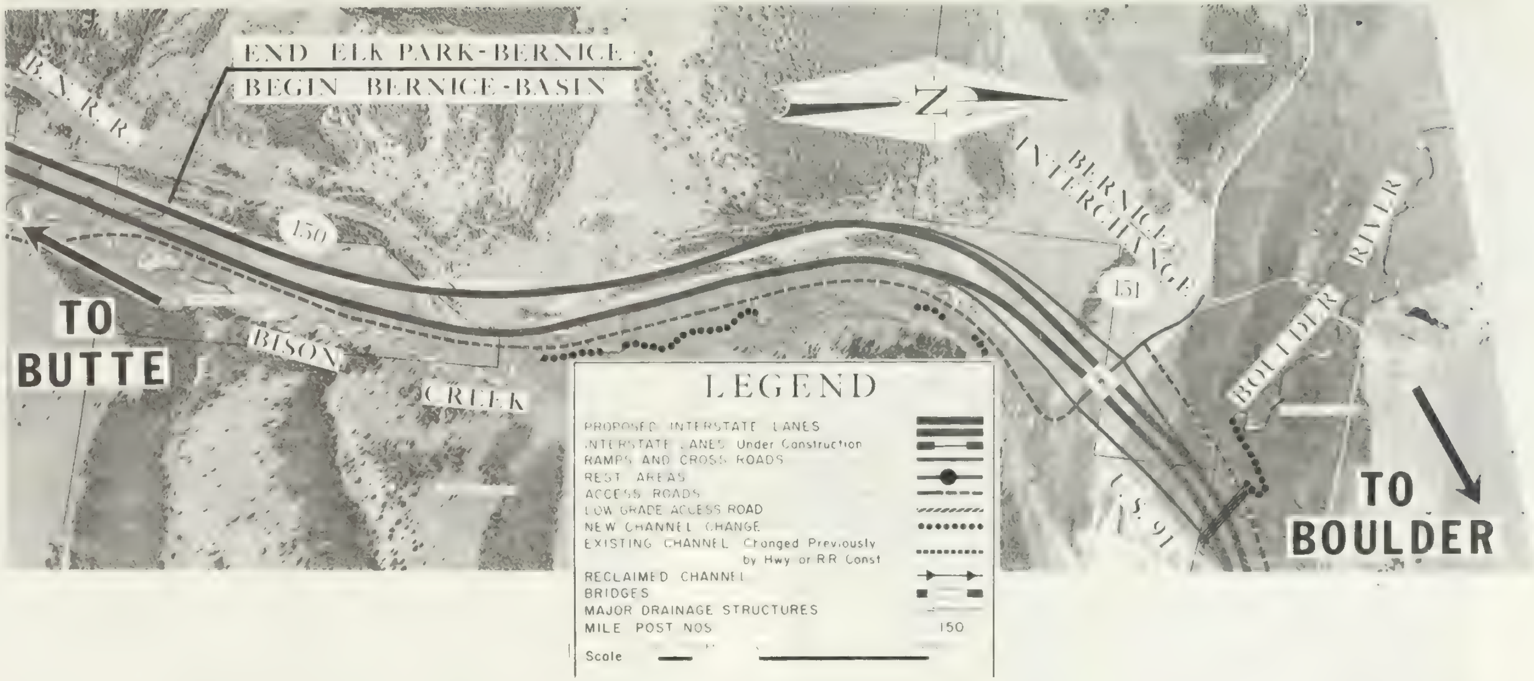


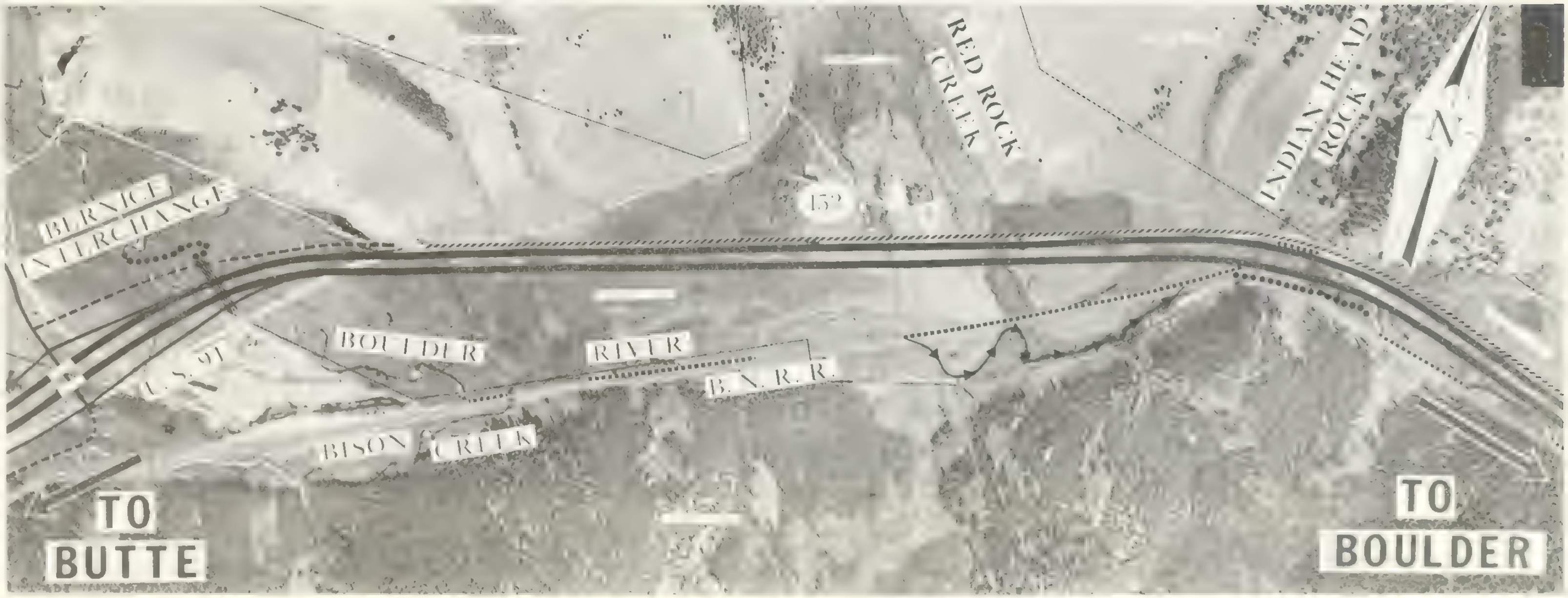
INTERSTATE 15 ELK PARK - BERNICE



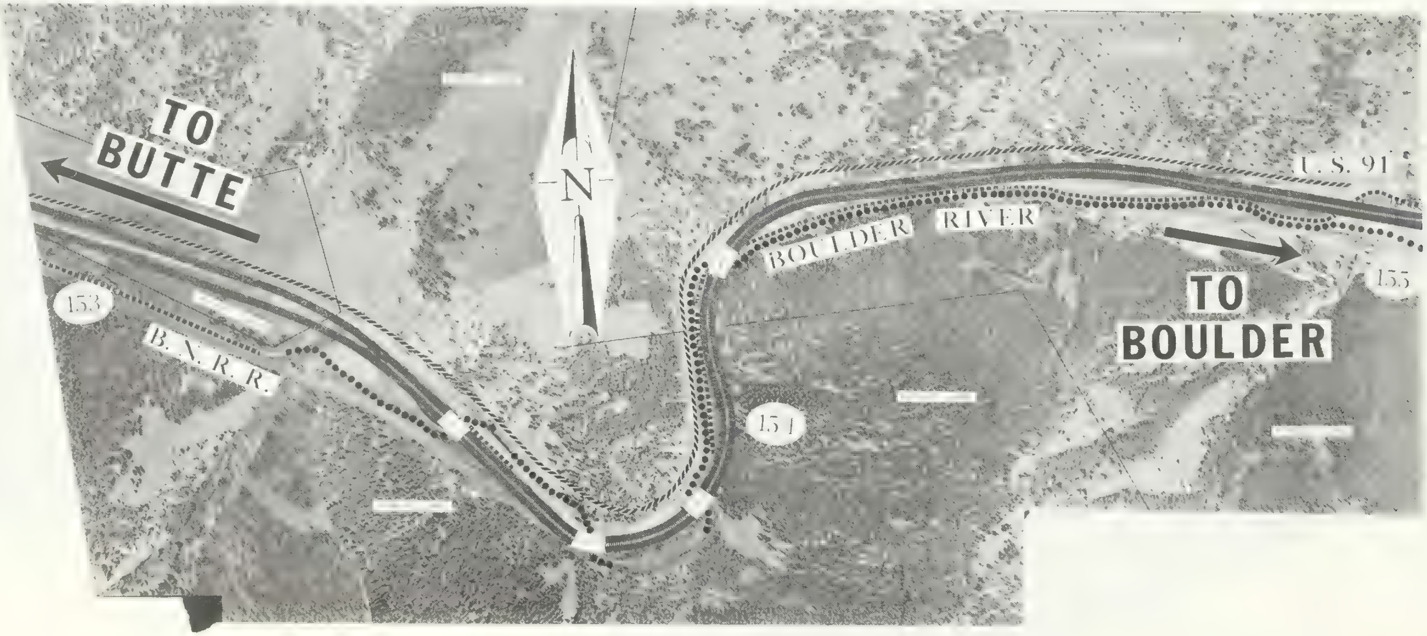


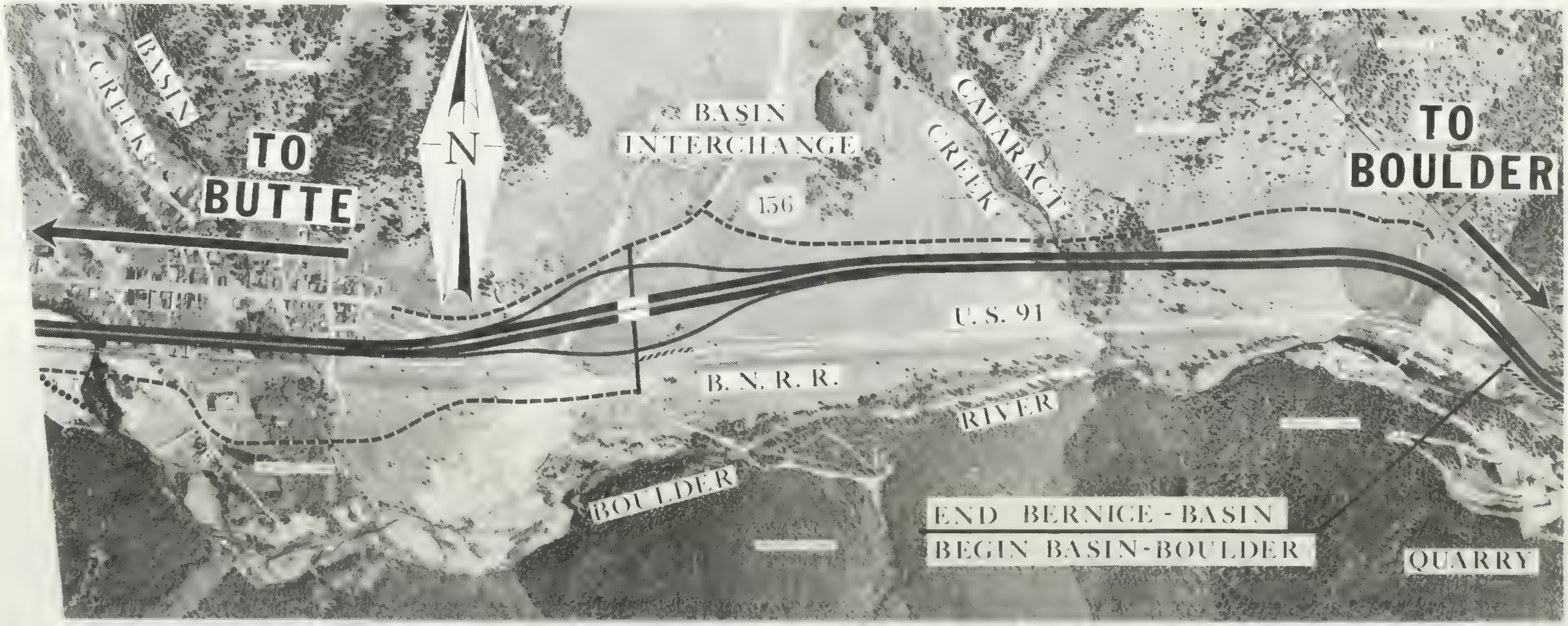
INTERSTATE 15 BERNICE - BASIN

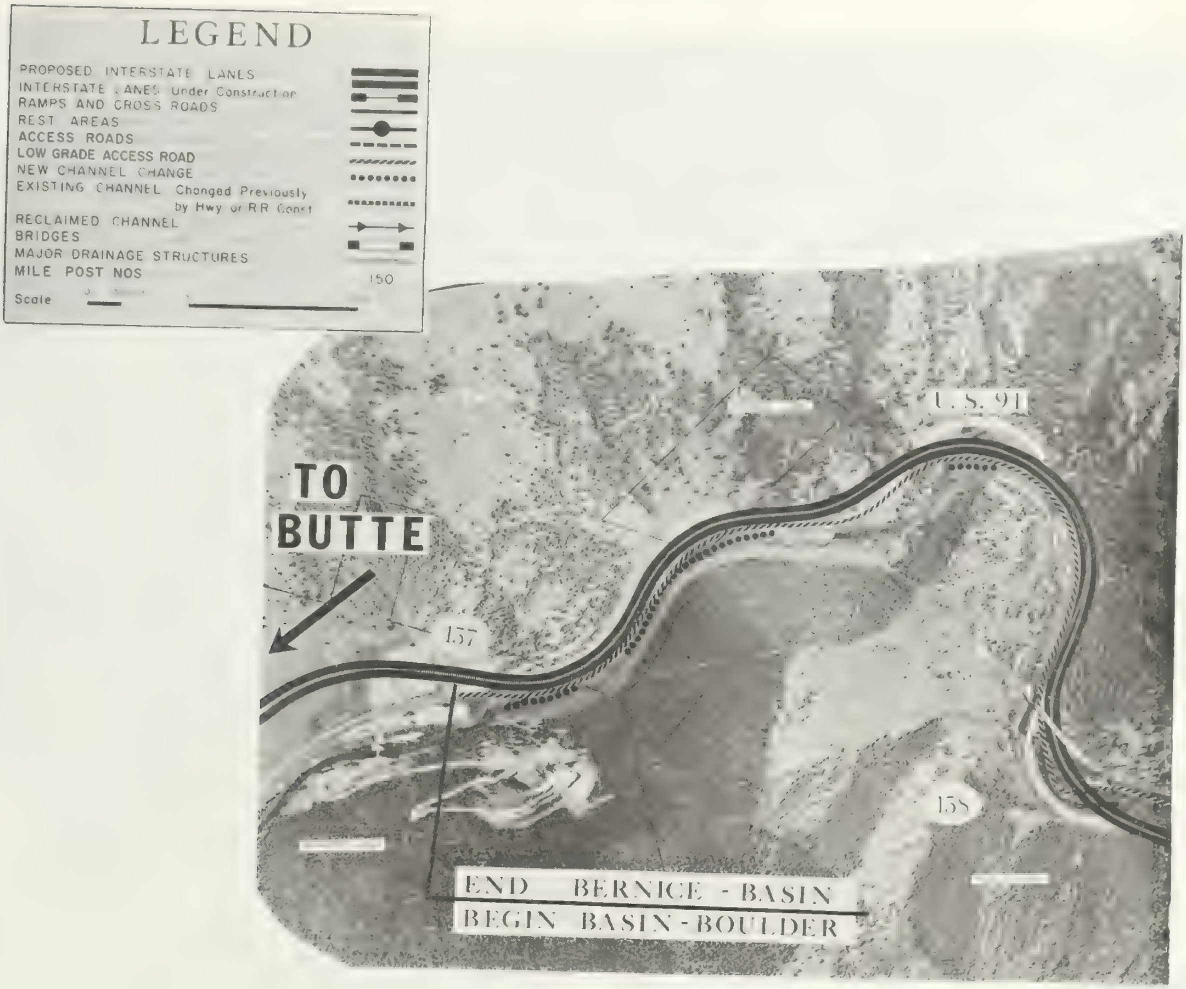


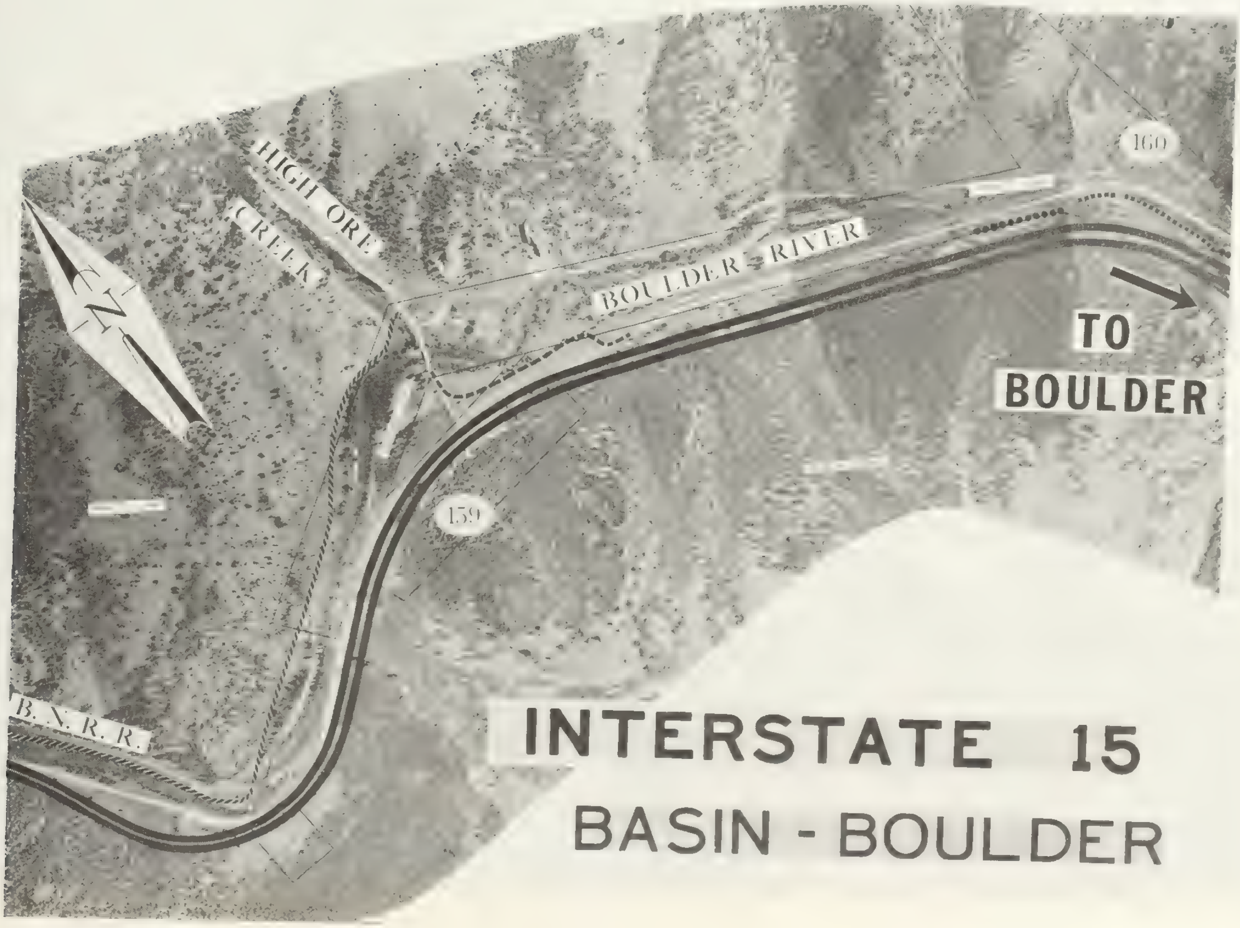


INTERSTATE 15 _ BERNICE - BASIN



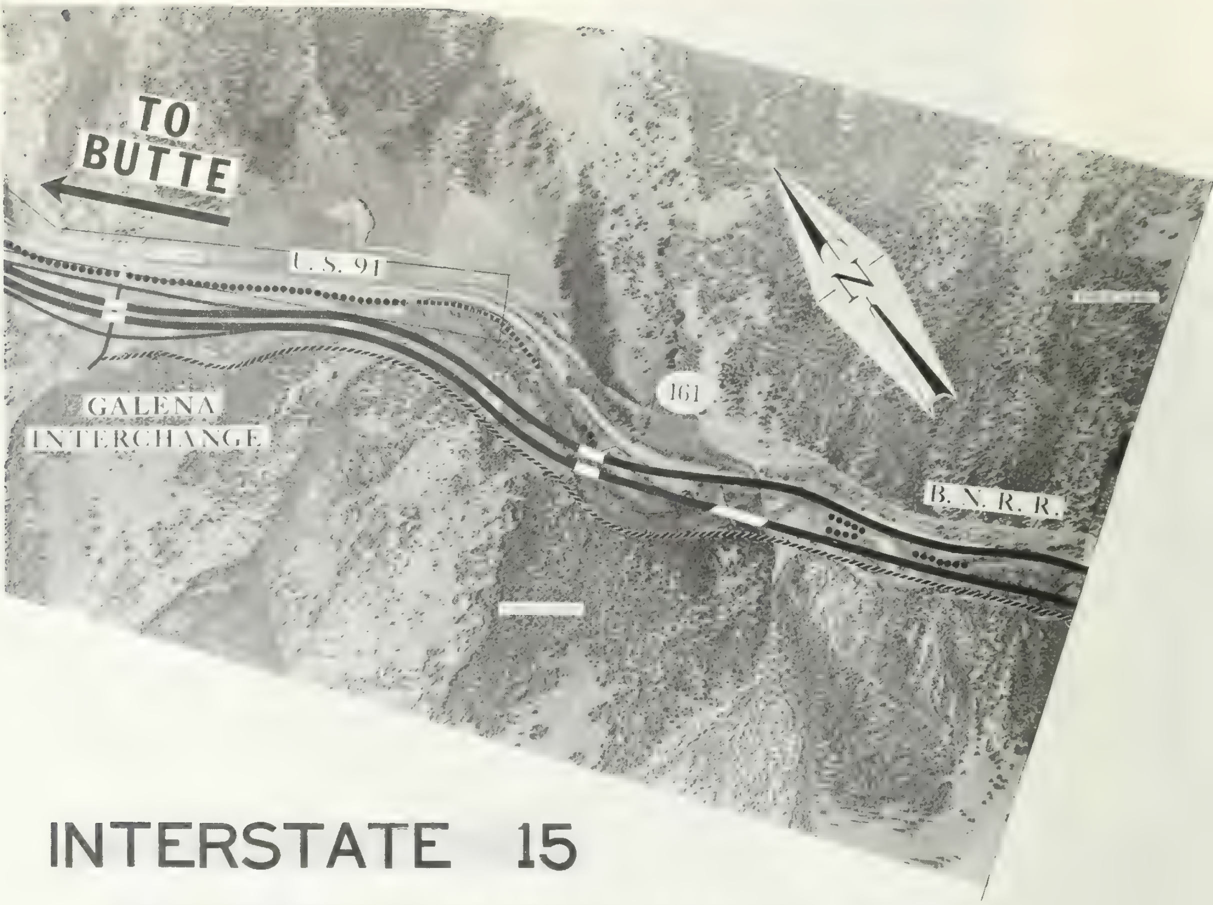




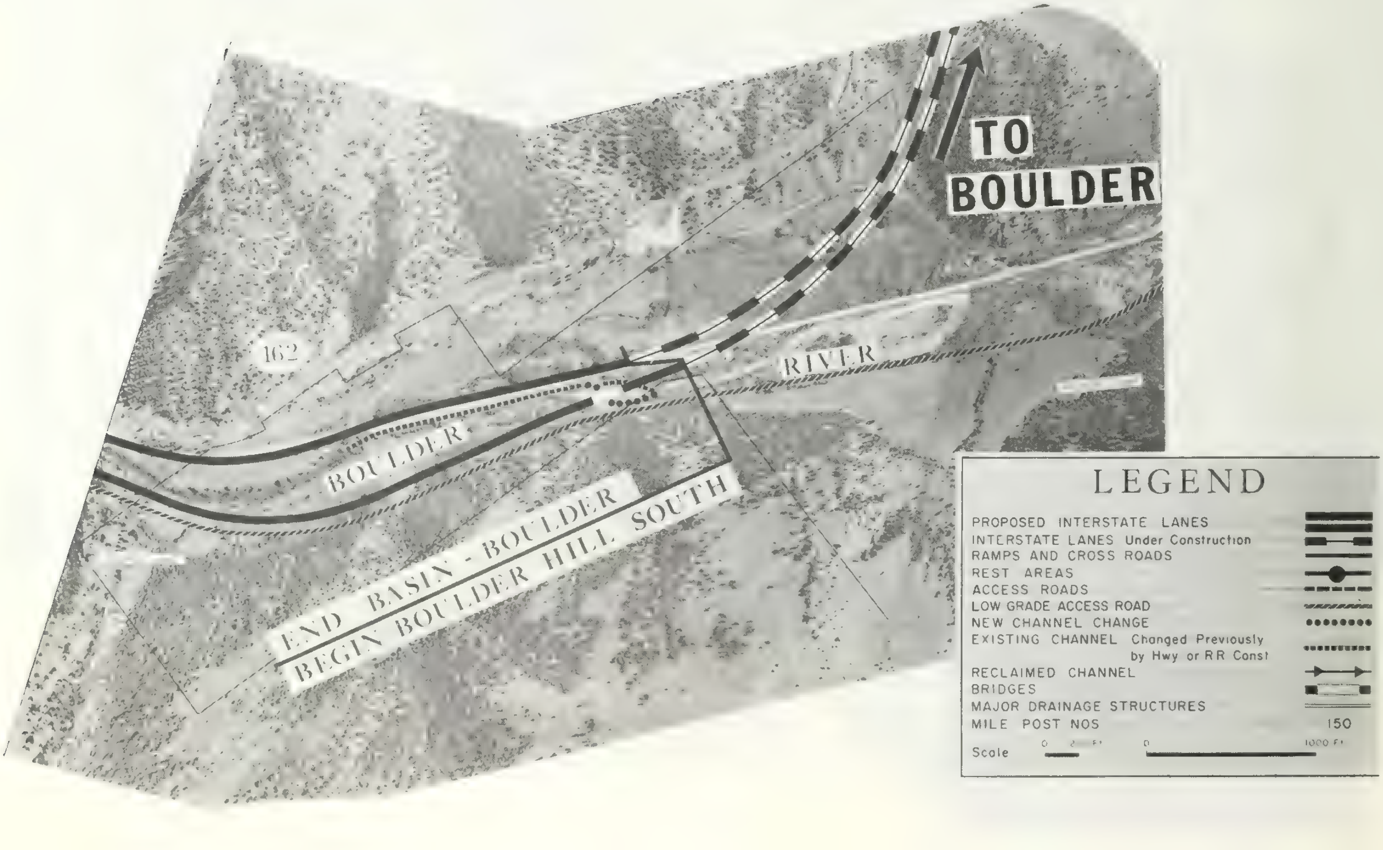


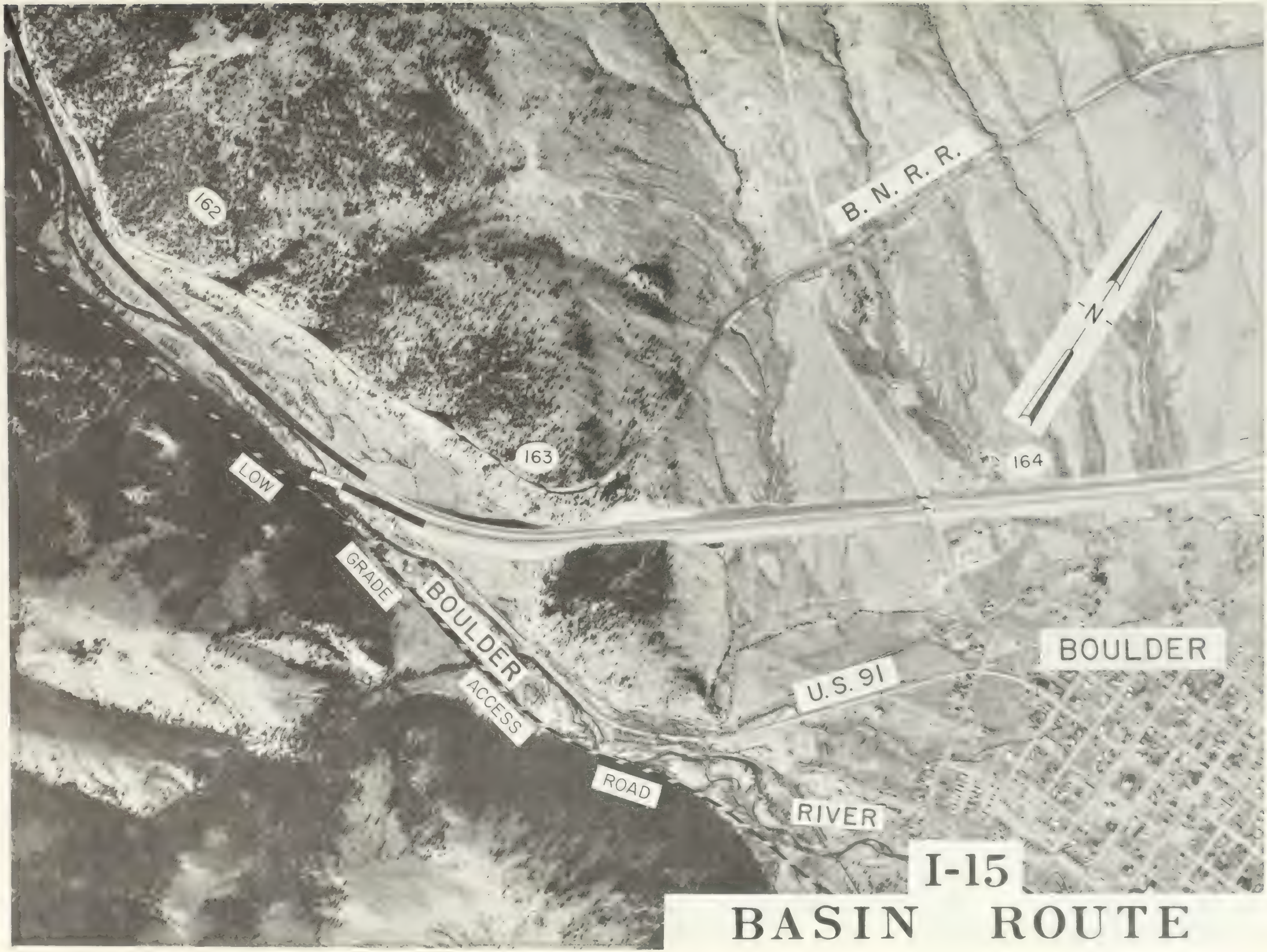
INTERSTATE 15

BASIN - BOULDER

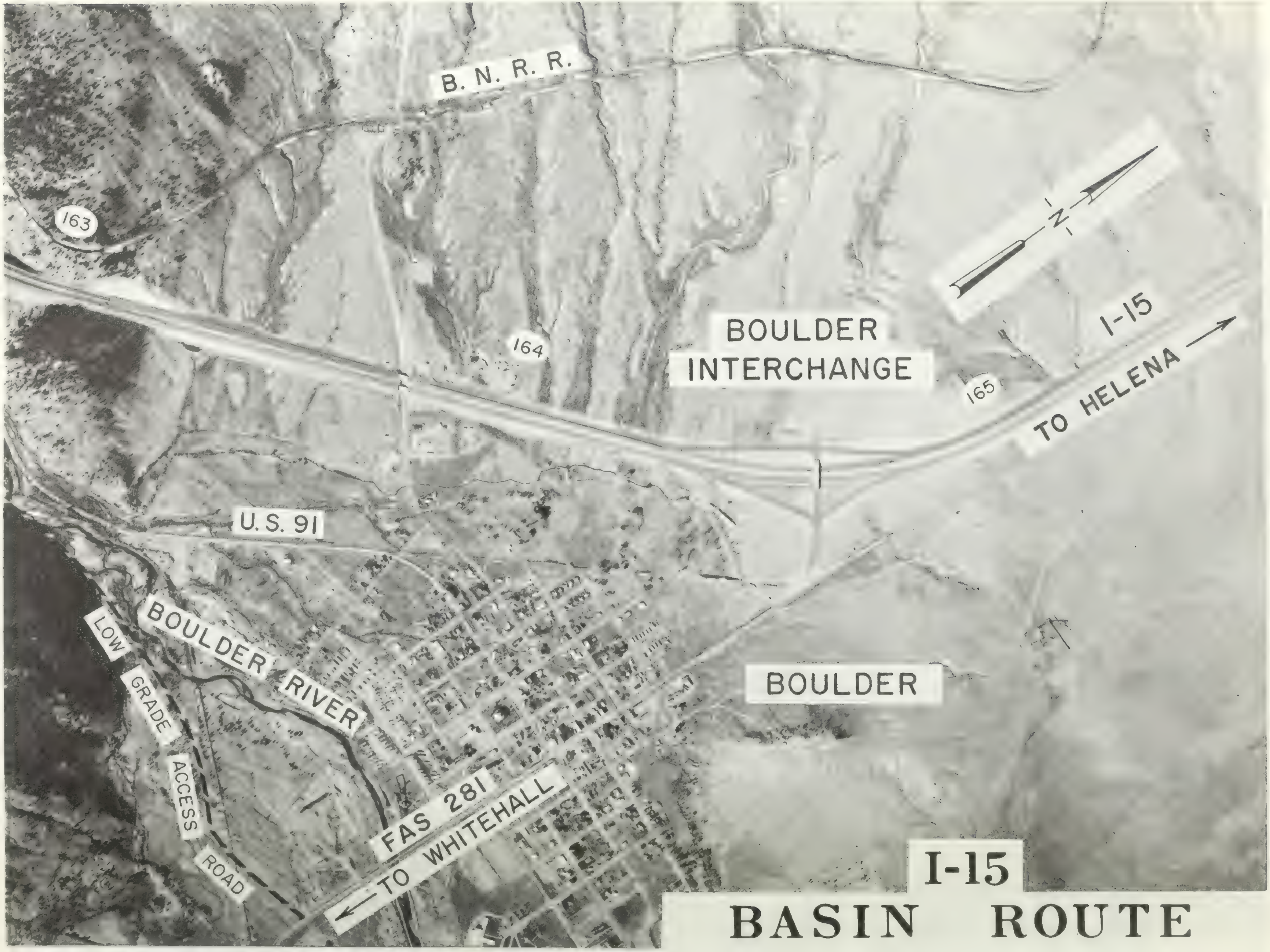


INTERSTATE 15
BASIN - BOULDER





I-15
BASIN ROUTE



I-15 BASIN ROUTE

ALTERNATE 2 - NEZ PERCE ROUTE.

This route corridor would begin at the East Butte Interchange common point, on Interstates I-15 and 90 and would follow the presently constructed two lane I-15 for about five miles on near tangent alignment with grades up to 5% to the continental divide at Elk Park Pass (elevation 6,368) at Mile 134 as does the Basin Route. From here the alignment would generally parallel the existing highway for about two miles and would then veer to the north east at Mile 136.5 to begin its ascent to Nez Perce Pass. From Mile 134 to 136.5 the terrain is open and grass covered and the grades would be flat. The alignment would be essentially tangent. A 100 foot distance between centerlines of parallel lanes would be used here.

Near Mile 137 the lanes would converge to form a narrow median section with median barrier rail for their climb up the minor drainage of Sawmill Gulch to cross Nez Perce pass at Mile 142.5 (elevation 7,420 feet). Grades in this section reach 5% and the curvature is moderate with the maximum being 5 degrees. The area is densely forested. After crossing the pass the grades are relatively flat and alignment is essentially tangent as the roadway crosses the high marsh known as Little Boulder Park.

At mile 144 this alternate begins its descent down the Little Boulder River canyon on 5% grades and with curvature which reaches a maximum of 7 deg. 30 min. at five locations. The 5% grade continues to mile 153 where it flattens out and the curvature is more moderate as it leaves the narrow canyon and crosses the low rolling hills to tie into I-15 south of the existing Boulder Interchange. Between Nez Perce Pass and the mouth of the Little Boulder Canyon at Mile 154, the canyon is narrow with steep side slopes which are generally heavily forested. The Little Boulder River flows down this canyon. It is a small stream which is largely in an undisturbed state.

The route corridor from Sawmill Gulch to the mouth of the Little Boulder Canyon runs through a virtually undisturbed forest environment. Unimproved roads lead a short distance into each end of this area but no through roads exist. Most of this area is U.S. Forest Service lands, part of the Deer Lodge National Forest.

Two interchanges would be provided. Woodville Interchange would be located at Mile 134.5 near Elk Park Pass and the other near Mile 148 at Moose Creek. There is no evident resource, recreation or other needs that justify continuous frontage roads through the canyon parallel with the interstate and none are proposed for this Route.

Near the mouth of the Little Boulder Canyon the alignment would pass near a site which is being considered by the U.S. Soil Conservation Service for an irrigation reservoir. The Roadway location would not infringe upon this site but would be adjacent to it for one mile.

SECTION 4 (f) LANDS Along the Nez Perce Route.

Section 4 (f) lands along this corridor consist of the Elder Creek campground, administered by the Forest Service, and a recreational site which is used by the Boulder River School and Hospital under a special land-use permit from the Bureau of Land Management.

Elder Creek Campground is located in the SE¼ of Section 14, Township 5 North, Range 5 West, approximately 6 miles south of Boulder, Montana. The campground covers approximately two acres of land and is designed primarily to provide facilities for picnicking. Improvements in the campground consist of 7 picnic units and two camp units with tables, benches, fireplaces, garbage cans and pit-type toilets. The campground is enclosed by a pole fence and Elder Creek runs along the southwesterly side. Scattered trees within the campground provide shade and there is an open play area. Little Boulder Creek runs opposite the campground along the southerly side of the road. The campground lies in a canyon and is surrounded by fairly steep slopes covered by sparse to moderate amounts of trees and brush.

Access to the campground is by an unsurfaced Forest Service road. This road is narrow, rough and difficult to travel and is no doubt a factor in the relatively light use of this campground There is no vehicular access into the campground, but parking space is available on both sides of the road adjacent to the campground.

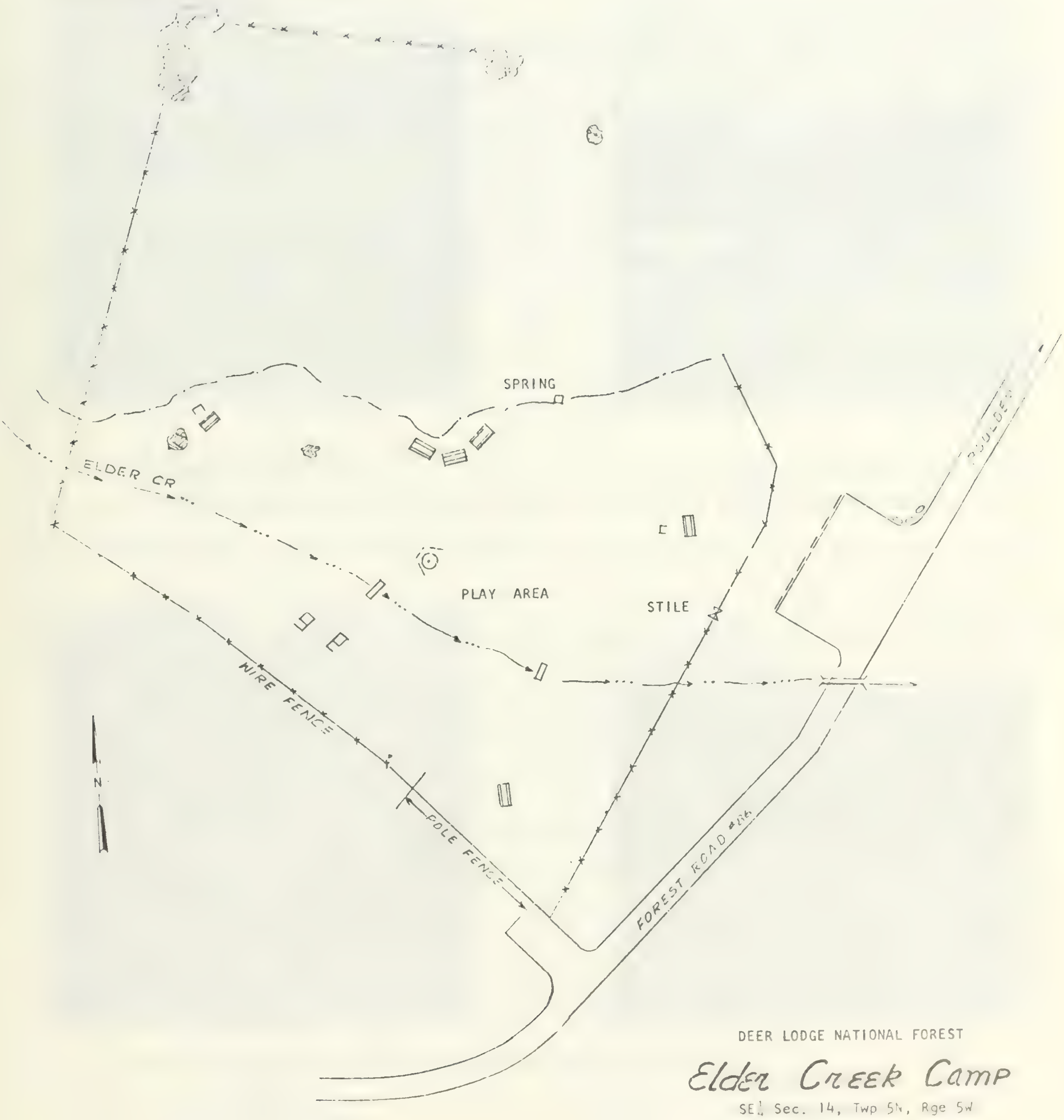
The campground will accommodate 25 people at one time, and average use is at 20% of capacity Weekend use is estimated by the Forest Service at up to 50% of capacity. Type of use is 95% by local people and 5% by out-of-area travelers. Average length of stay is one day. Forest Service figures show use by 400 persons in 1967. Figures for individual use in subsequent years is not available.

The narrowness of the canyon at this point makes it evident that the campground would be totally eliminated, either through the necessity of its use in construction or by the taking of access if this alternate were constructed

Near Mile 155 the U.S Soil Conservation Service is considering constructing an irrigation reservoir There could be recreation facilities developed in connection with this project If the Nez Perce Route were constructed and if the reservoir were built there would be no conflict between the two projects Access to the lake area would not be affected by the interstate except for possibly along a short section of the west shoreline at the upstream end.

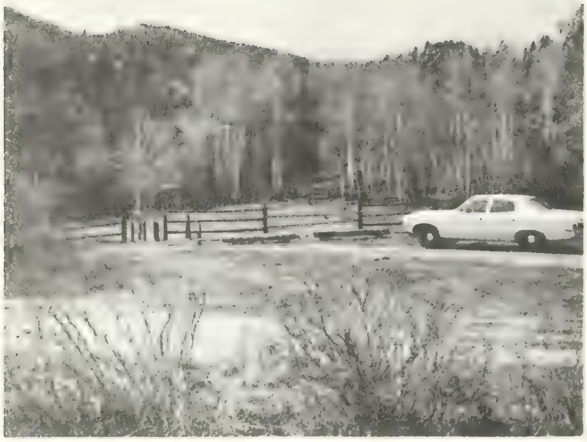
There are eight summer home cabins located in the Sawmill Gulch area on sites leased from the Forest Service on either annual lease or term permit. In section 17, Township 4 North, Range 6 West, there are several owners who have recreational summer homes on privately owned land. Access to these cabins would be altered, but it is anticipated that access could be feasibly perpetuated or restored. Several of these summer homes or cabins would be near the new highway. Two cabins near Elder Creek Camp would lose access and require relocation.

There were two ponds, known as the B & B Fish Ponds, located in the Sawmill Gulch area approximately 8 miles north of Butte, Montana. The lower pond was washed out and is now grassed over and used as grazing land. The upper pond is owned by the Butte Gun Club and is used for retriever trials This pond encompasses less than one acre of land and would be affected only by alteration of access. The Nez Perce route would provide access via a frontage road from the Woodville interchange.



PLAN LAYOUT OF EXISTING FACILITY

Figure 4



CAMPGROUND FROM
ACROSS ROAD LOOKING NW

SOUTHEAST CORNER
LOOKING NORTH

ENTRANCE
LOOKING NW

LOOKING SE
FROM NORTH EDGE

ELDER CREEK CAMP

DE FACTO SECTION 4 (f) LANDS Along The Nez Perce Route.

Present de facto recreational use of the area along this proposed route is largely limited to big game hunting and fishing. The area is inhabited by mule deer, elk, moose and black bear, grouse and other lesser game and wildlife species. Other than hunting and fishing, little recreational use of the area is made with the exception of a recreational site comprising 60 acres located in the SE¼ of Section 8, Township 5 North, Range 4 West, which is used by the Boulder River School and Hospital through a special land-use permit from the Bureau of Land Management. This site provides an opportunity for those at the school to have a place for picnics, relaxing and hiking and it is not considered to be a public camp or picnic ground. Access is by the Forest Service road which runs up the Little Boulder River It is probable that no portion of this site would be taken in construction of this alterante, nor would the present access be distrubed. However, this alternate would be constructed in close proximity to this site and there would be the addition of noise from the highway which could disturb the tranquility and quietness which now exists. If it were determined that the project would have a significant adverse impact on this site, it could be relocated on other B.L.M. managed lands in the vicinity.

Random access for any purpose as it now exists from Nez Perce Pass to the mouth of the Little Boulder River Canyon would be restricted along this route, due to the access control feature of Interstate, except for areas which can be reached through the Moose Creek interchange. This interchange would provide access to some areas which are not extensively used now.

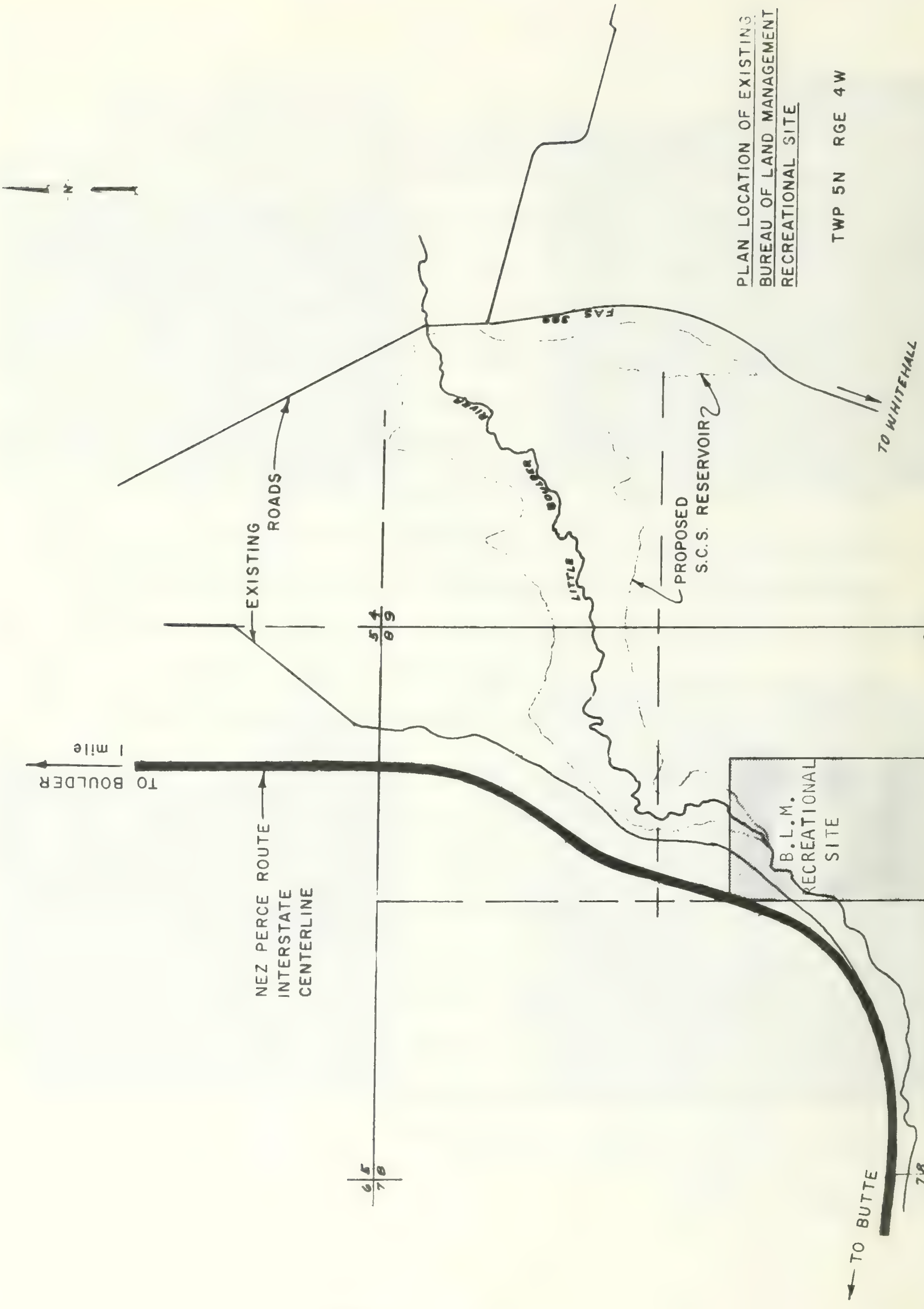
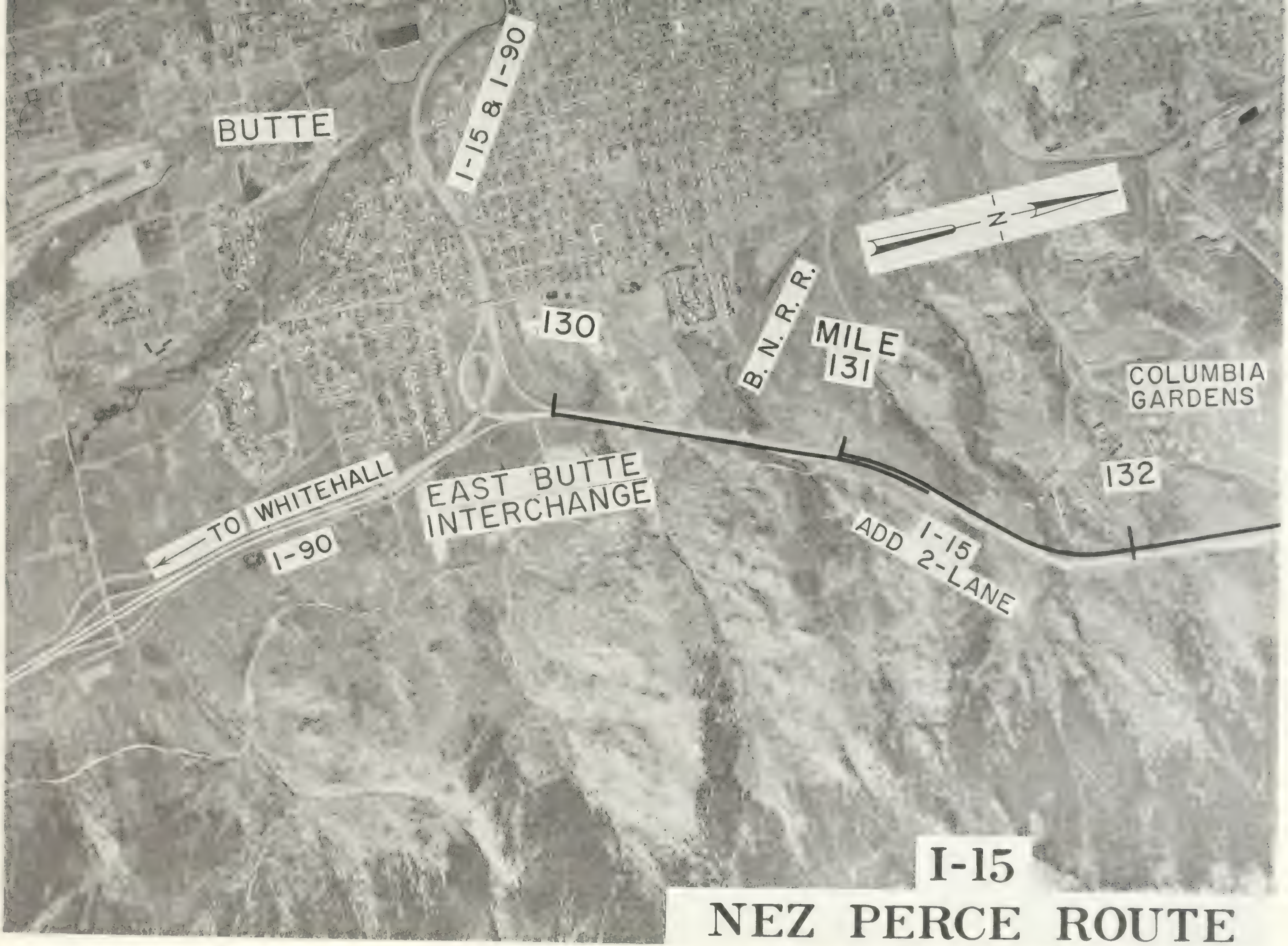

PLAN LOCATION OF EXISTING
BUREAU OF LAND MANAGEMENT
RECREATIONAL SITE
TWP 5N RGE 4W
N
EXISTING ROADS
PROPOSED S.C.S. RESERVOIR
LITTLE BOULDER RIVER
FAS 399
TO WHITEHALL
TO BOULDER
1 mile
NEZ PERCE ROUTE INTERSTATE CENTERLINE
B.L.M. RECREATIONAL SITE
TO BUTTE
5 4
8 9
8 9
17 16
6 5
7 8
7 8
18 17

Figure 5

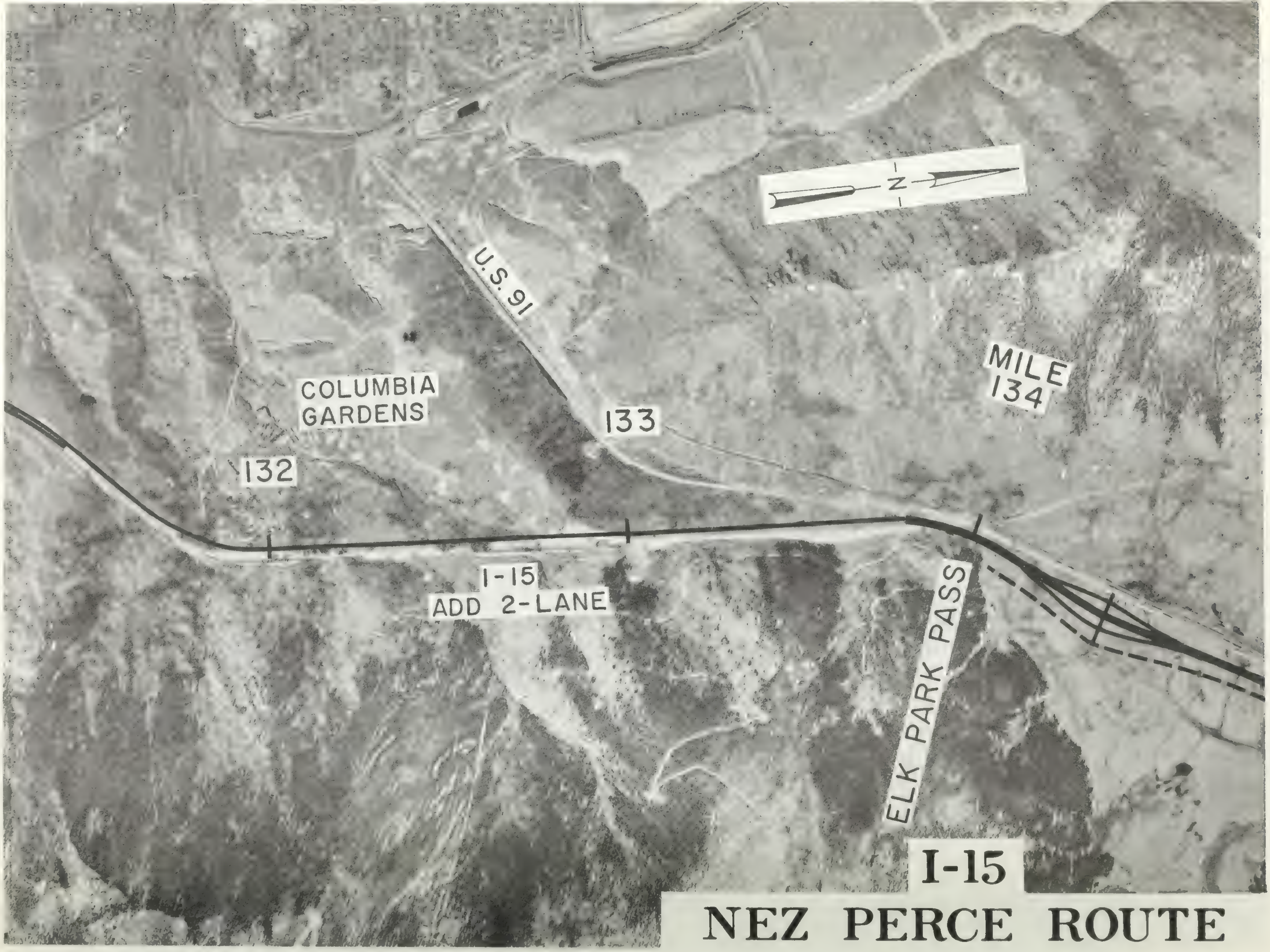
CAMP AREA FROM NORTH
LOOKING SOUTH

CAMP FACILITIES VIEWED
FROM ROAD LOOKING EAST

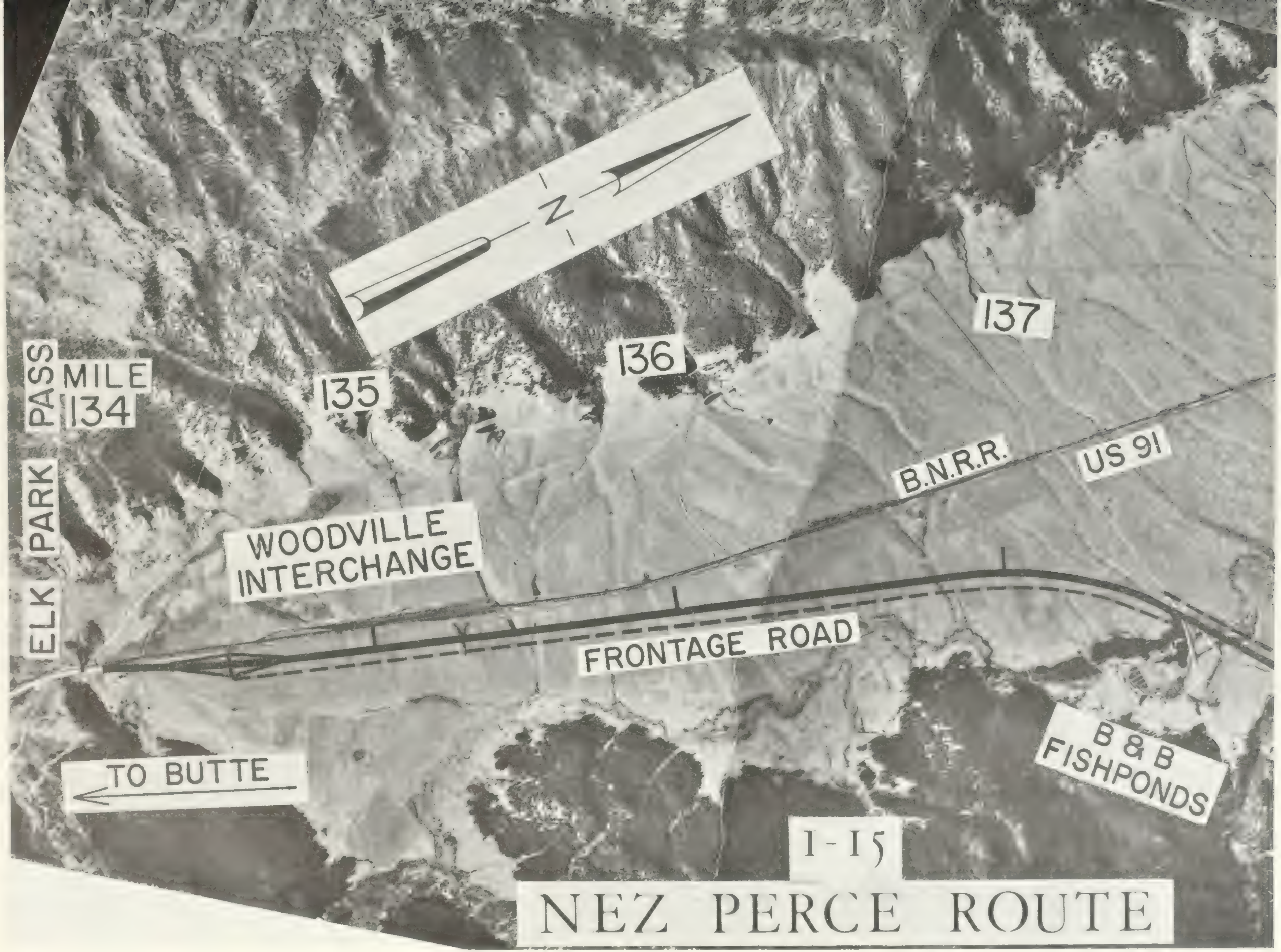
B.L.M. RECREATIONAL SITE

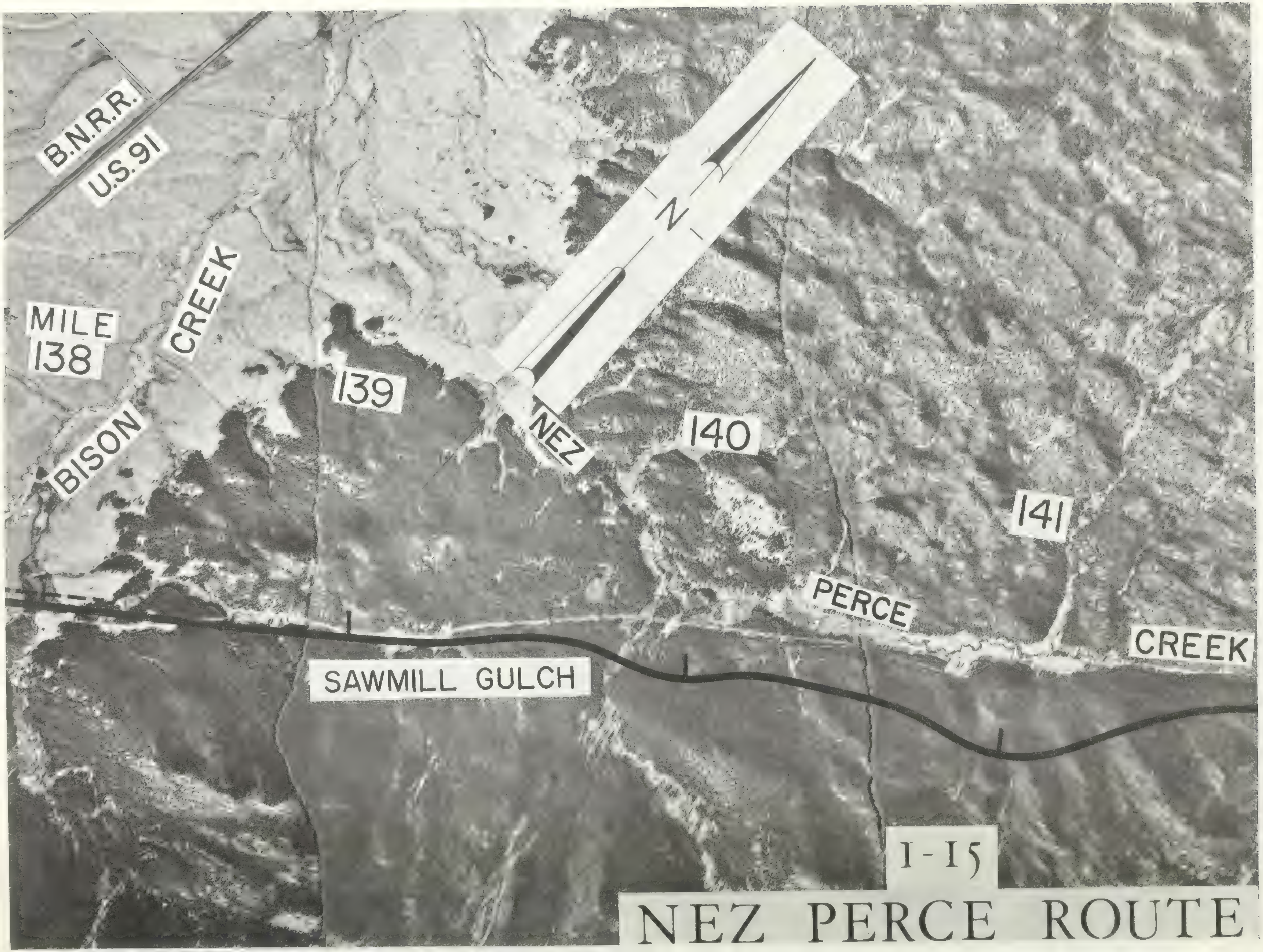


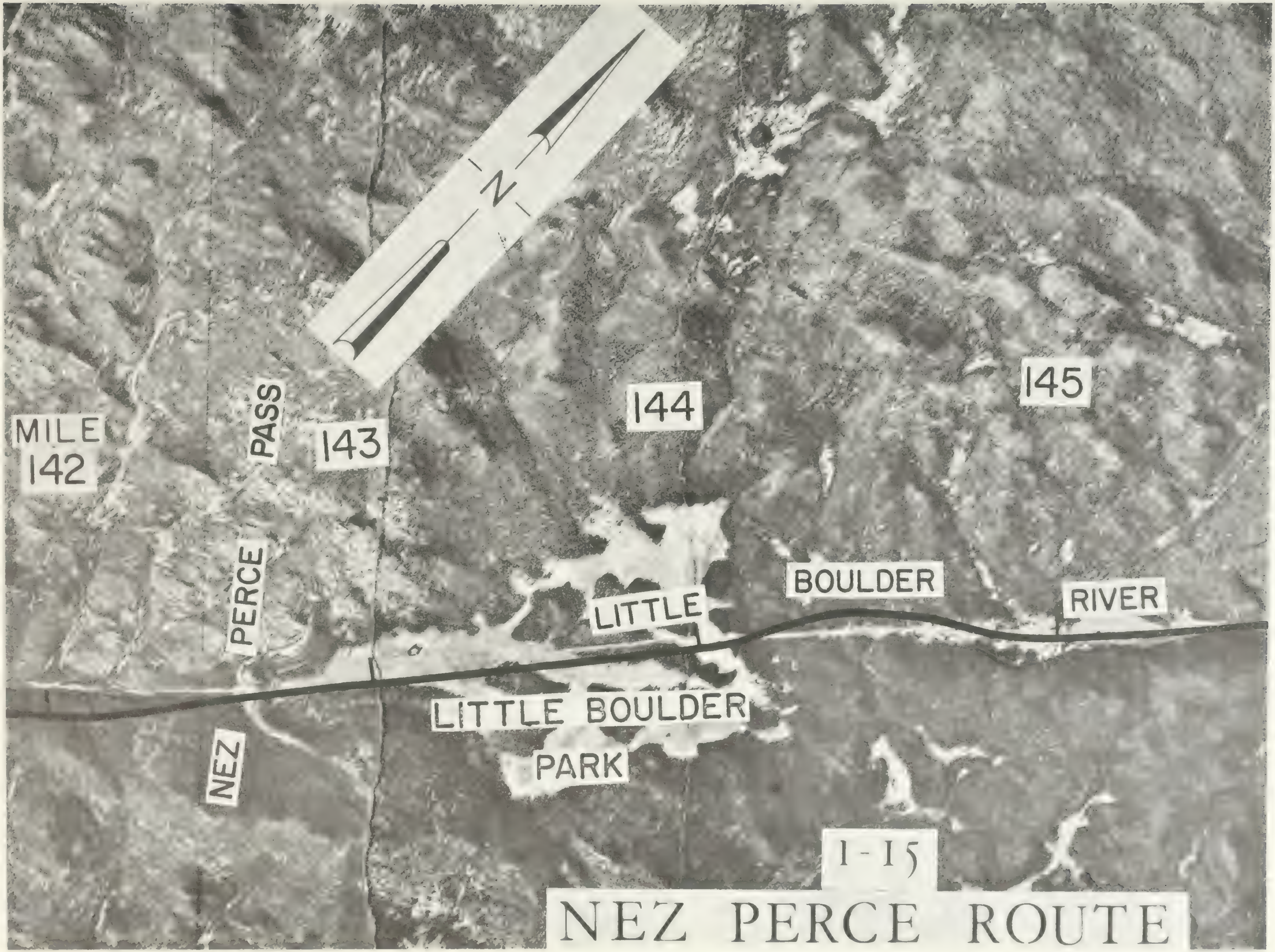
I-15
NEZ PERCE ROUTE

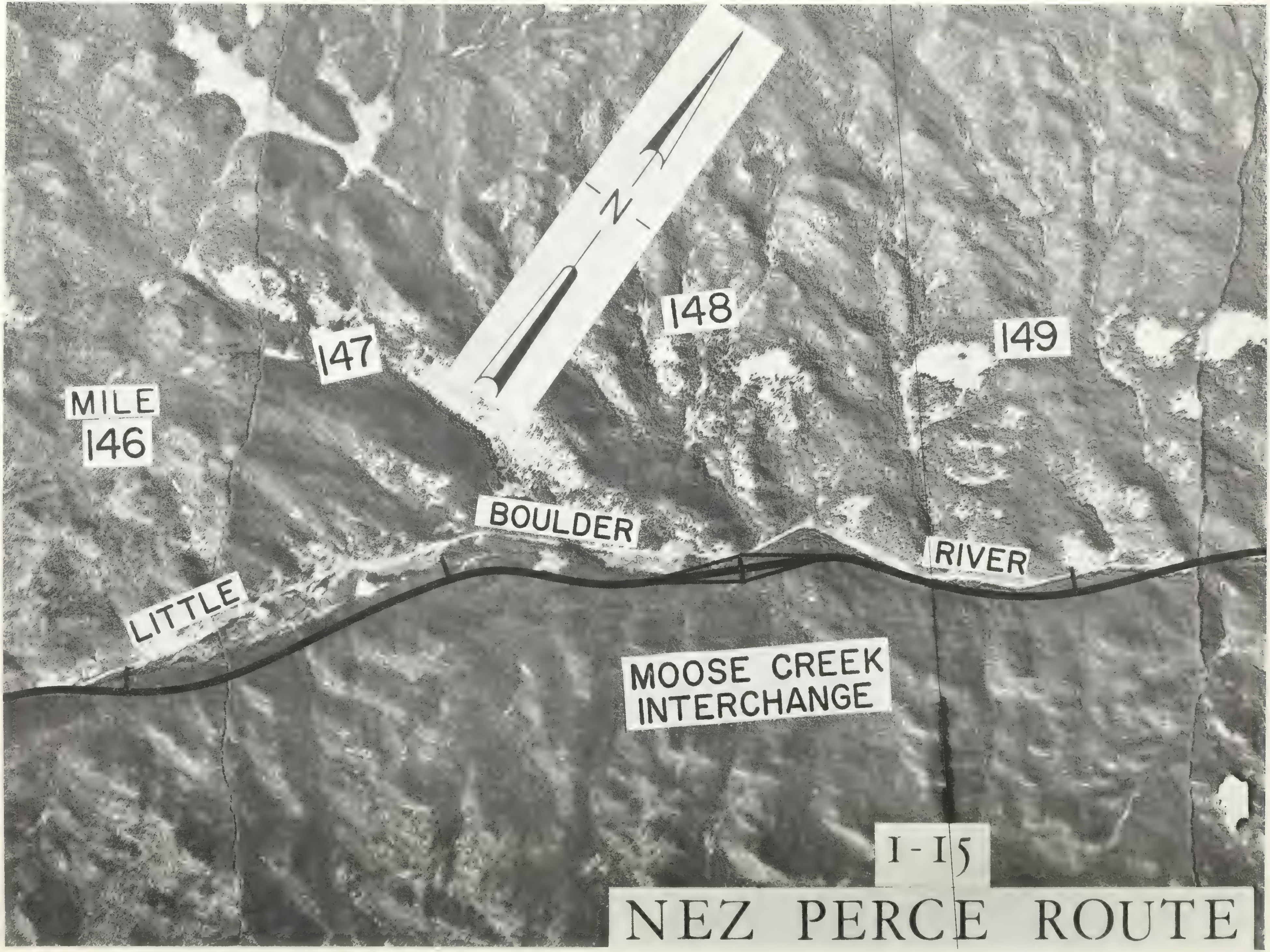


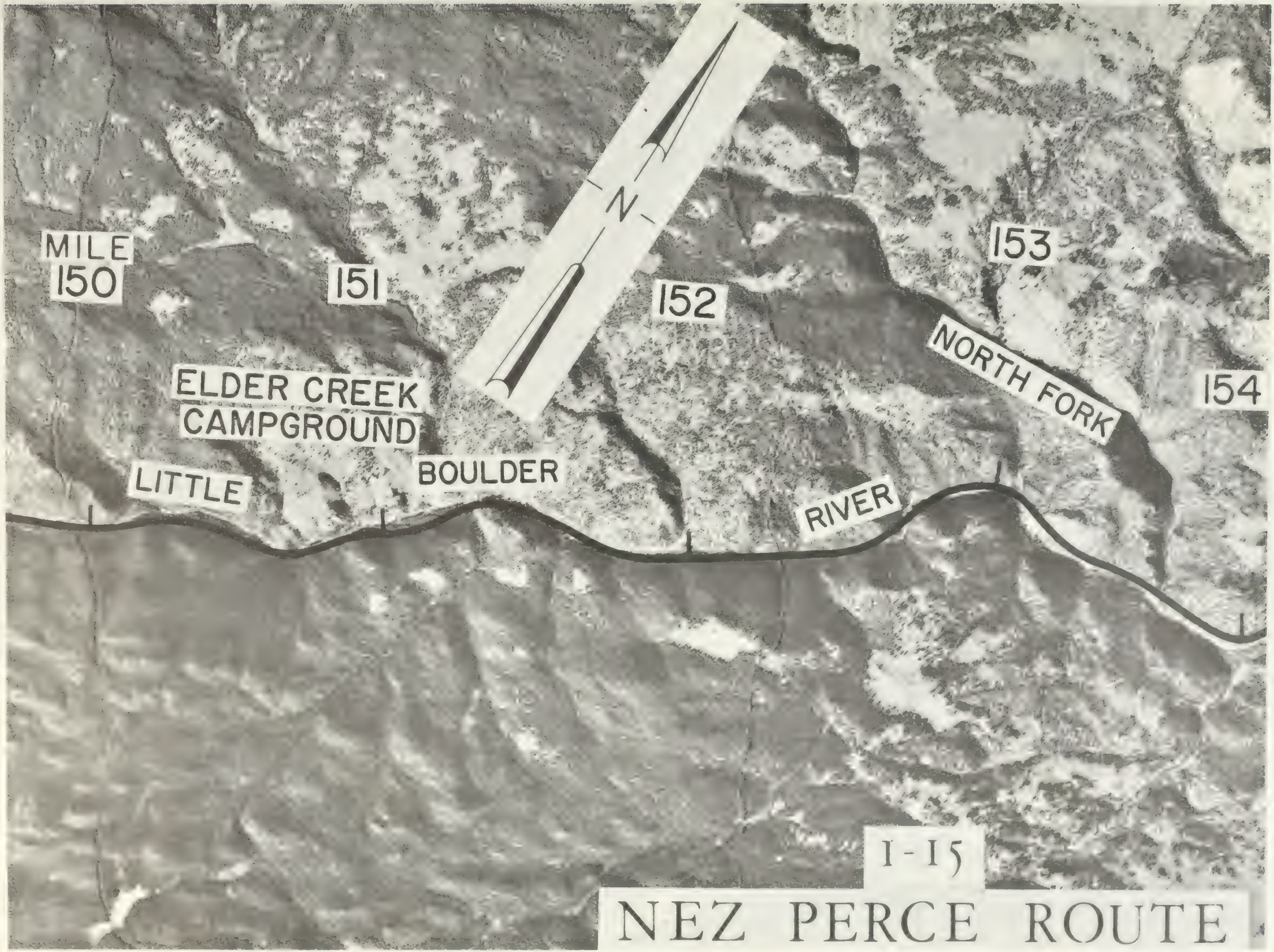
I-15
NEZ PERCE ROUTE

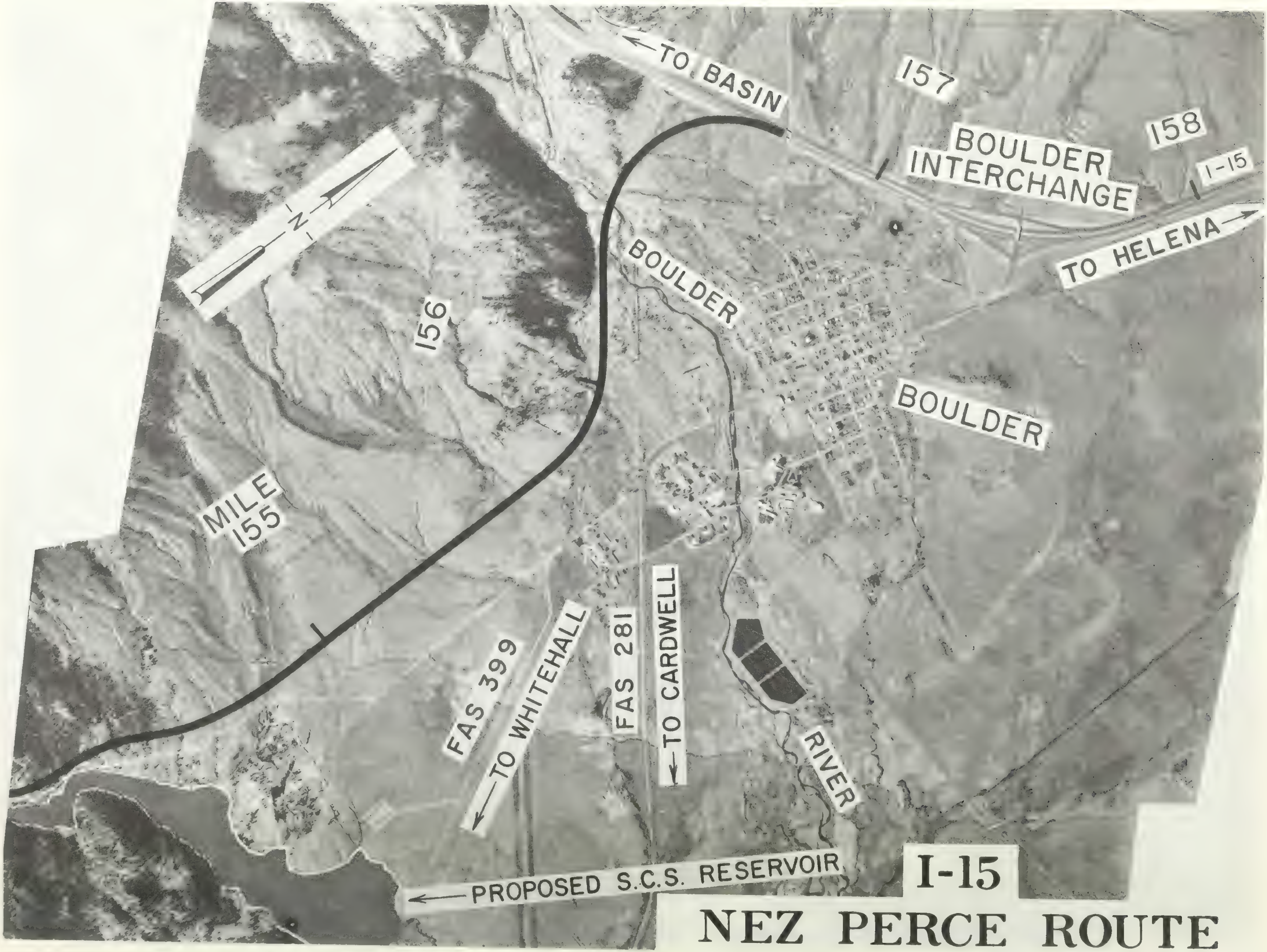

N
137
136
135
ELK PARK PASS
MILE 134
US 91
B.N.R.R.
WOODVILLE INTERCHANGE
FRONTAGE ROAD
TO BUTTE
B & B FISHPONDS
I-15
NEZ PERCE ROUTE


B.N.R.R.
U.S. 91
MILE 138
BISON
CREEK
139
NEZ
N
140
PERCE
141
CREEK
SAWMILL GULCH
I-15
NEZ PERCE ROUTE


N
MILE 142
PASS
143
144
145
PERCE
BOULDER
RIVER
LITTLE
LITTLE BOULDER
PARK
NEZ
1-15
NEZ PERCE ROUTE


N
MILE
146
147
148
149
LITTLE
BOULDER
RIVER
MOOSE CREEK
INTERCHANGE
I-15
NEZ PERCE ROUTE


MILE
150
151
152
153
154
N
ELDER CREEK
CAMPGROUND
LITTLE
BOULDER
RIVER
NORTH FORK
I-15
NEZ PERCE ROUTE



I-15
NEZ PERCE ROUTE

ALTERNATE 3 - WHITETAIL ROUTE.

Beginning at the East Butte Interchange common point, this route would be common with existing four-lane Interstate 90 (I-90) for about 17 miles to a required new Interchange about five miles west of Whitehall. This section of I-90 extends almost due south for about three miles before turning east to climb over the continental divide at Homestake Pass (elevation 6,375 feet). The curvature is sharp in many locations and the grades reach 6%.

The highway then decends the eastern slopes of the divide with sharp curvature and steep grades to the required new Interchange at Mile 131 at the departure point of I-90. It would serve only to interchange traffic between the two Interstate routes at this junction and there would be no access to local lands at this point.

The I-15 route would turn north here on new alignment and would cross the foothills along the west side of Whitetail Valley to a point near Mile 139 where it would cross the existing Whitetail Road. An interchange would be built at this location. The grades would approach 4% for a short distance near the I-90 interchange but from there to the Whitetail they would be under 3% and curvature would be flat. Roadway design would consist of 100 feet between centerlines of parallel lanes.

From mile 139 to Mile 144 grades would be flat and the alignment would be essentially tangent. It would run nearly parallel to existing Whitetail road which would remain for local access. The grades steepen in the section between Mile 144 and 151 as the route climbs the south slopes to cross Whitetail Pass (elevation 5,730 feet) with a 40 foot deep cut. The alignment here is nearly tangent and the grades would reach 5%. The distance between centerlines would be 100 feet to Mile 148 where the lanes would narrow to a 38 foot distance between centers.

At Mile 151 the lanes would descend the north slopes of Whitetail Pass along Beaver Creek on grades reaching 5% and with moderately sharp curvature. The centerline width to Mile 153.5 is 38 feet. The grades level out and curvature becomes more moderate at Mile 153.5 where the roadway leaves the canyon and crosses the low foothills to tie into existing I-15 just south of the existing Boulder Interchange. The alignment would cross just downstream from the proposed U.S. Soil Conservation Service irrigation reservoir near Mile 154. No conflict between the two projects is expected although a grade separation structure may be required at Mile 155 to provide access to the reservoir.

The terrain from Mile 131 near I-90 to Mile 148 is open and grass covered. The valley here is wide and the roadway crosses two creeks, Whitetail Creek and Little Whitetail Creek only once each. Culverts are planned for these crossings. At Mile 148 the terrain becomes steeper and is covered with sparse to moderate stands of timber. The ground is broken by small canyons. The country is quite open at the pass but from here to Mile 153.5 the route would follow down the relatively narrow canyon of Beaver creek. Several crossings are anticipated using culverts. From Mile 153.5 to Boulder the road crosses low rolling foothills and small gulches.

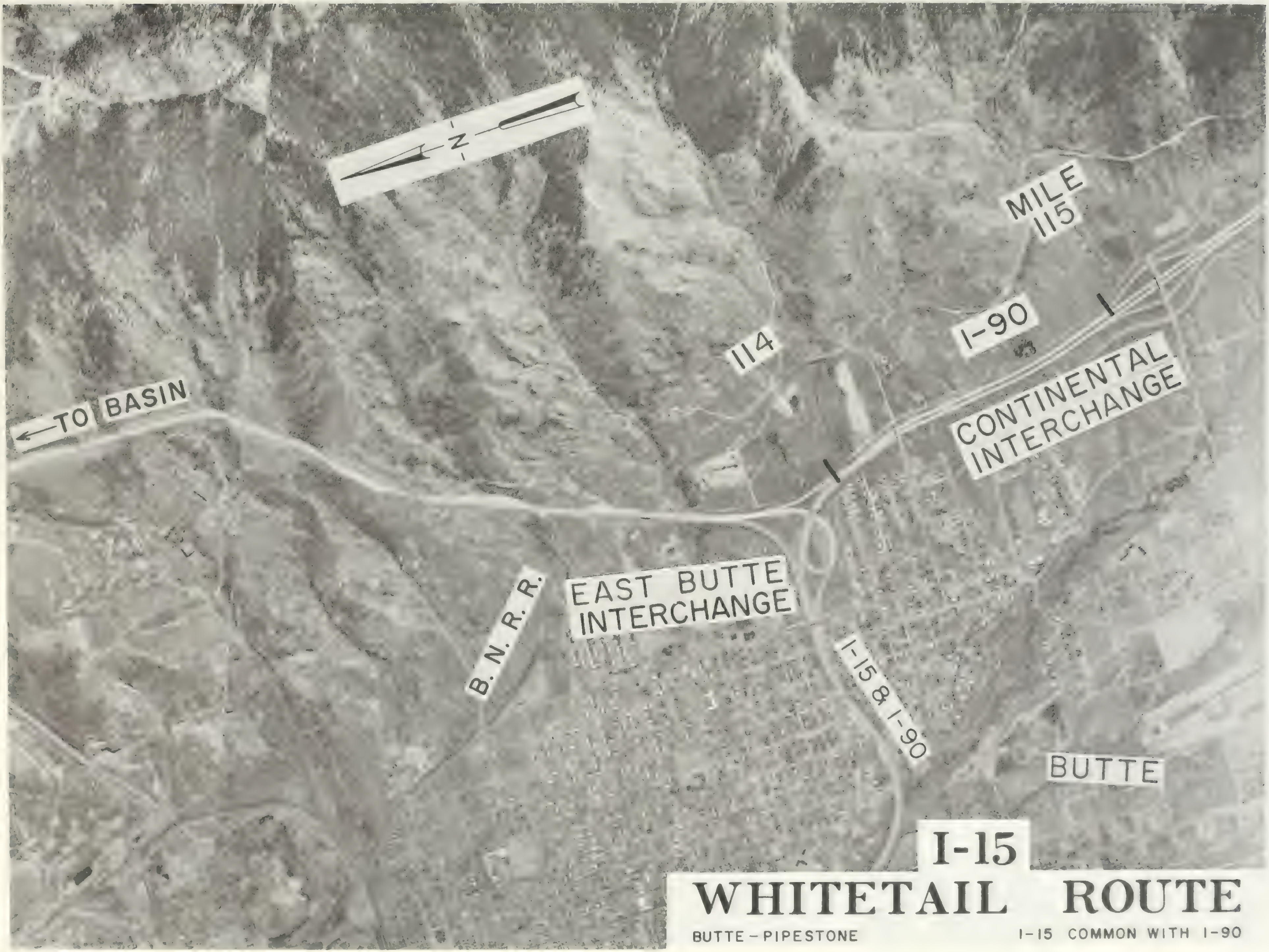
Whitetail, Little Whitetail and Beaver Creeks are within the route corridor. All are small with low flows and little interference with them would be anticipated with the exception of Beaver creek which would be crossed several times. It is small and does not flow year around.

SECTION 4(f) LANDS Along the Whitetail Route

Approximately 16 miles of this route north of I-90 is over open grassland terrain across private lands which provides little opportunity for recreational purposes. There are no designated camping or other recreational sites within this route corridor.

DE FACTO SECTION 4(f) LANDS Along the Whitetail Route

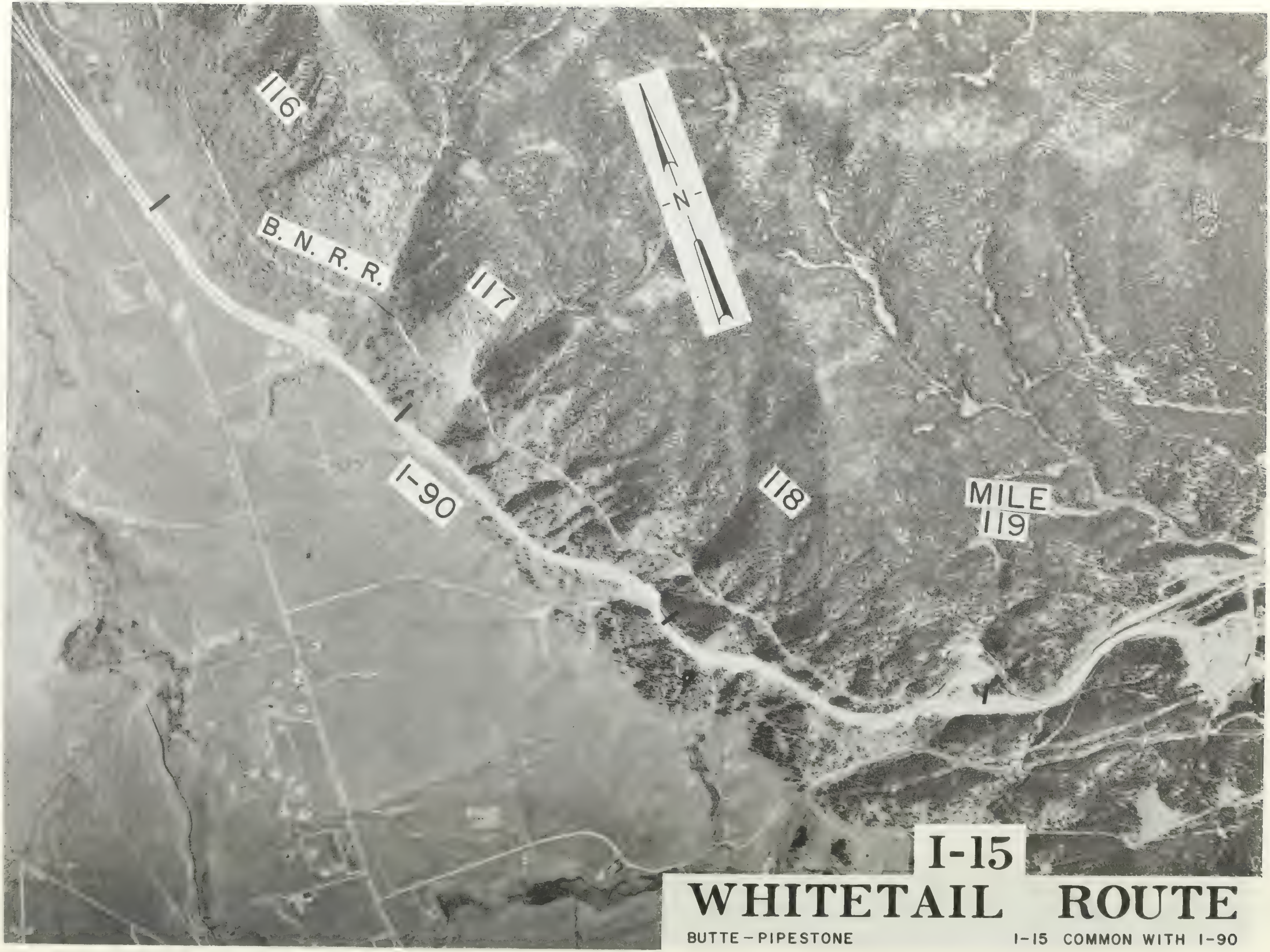
Some use is made of the area in the immediate vicinity of Whitetail Pass by snowmobilers and hunters. This is noted by the Forest Service as a de facto recreation area. There may be occasional use of areas along Beaver Creek for camping, picnicking and related recreational use, but such use is negligible. However, this use would not be available with a controlled access Interstate.



I-15
WHITETAIL ROUTE

BUTTE – PIPESTONE

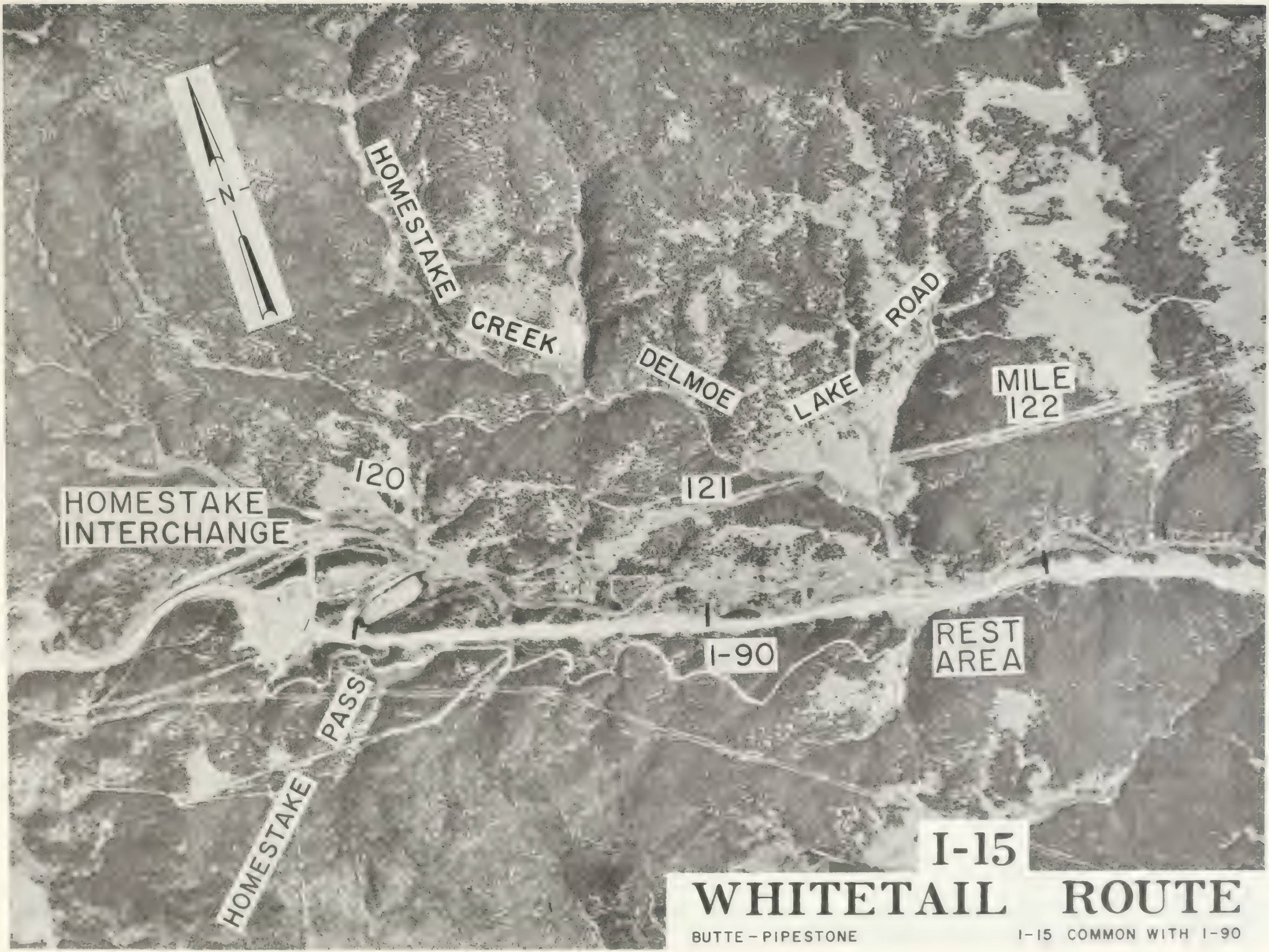
I-15 COMMON WITH I-90



I-15
WHITETAIL ROUTE

BUTTE – PIPESTONE

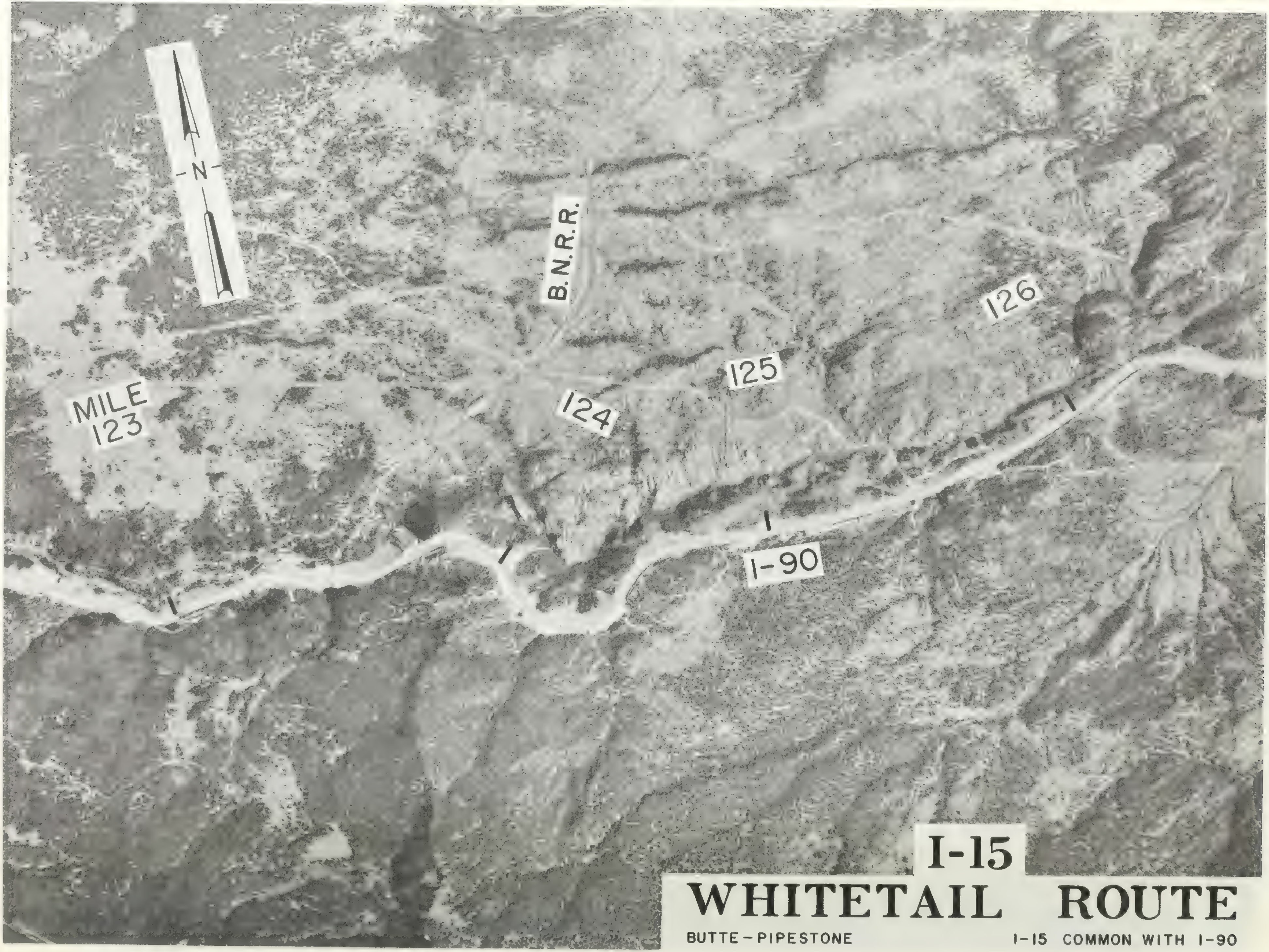
I-15 COMMON WITH I-90



I-15
WHITETAIL ROUTE

BUTTE – PIPESTONE

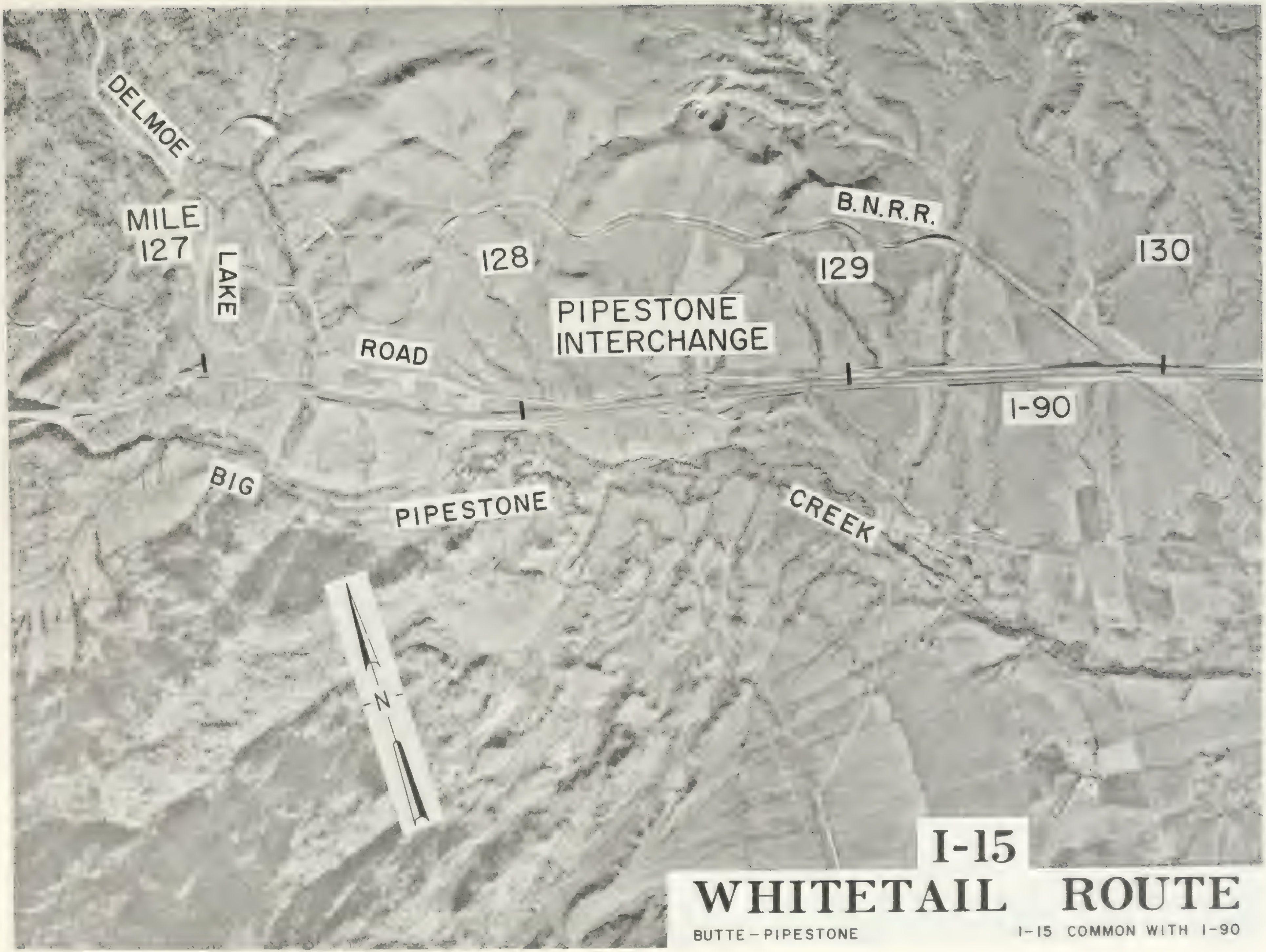
I-15 COMMON WITH I-90



I-15
WHITETAIL ROUTE

BUTTE – PIPESTONE

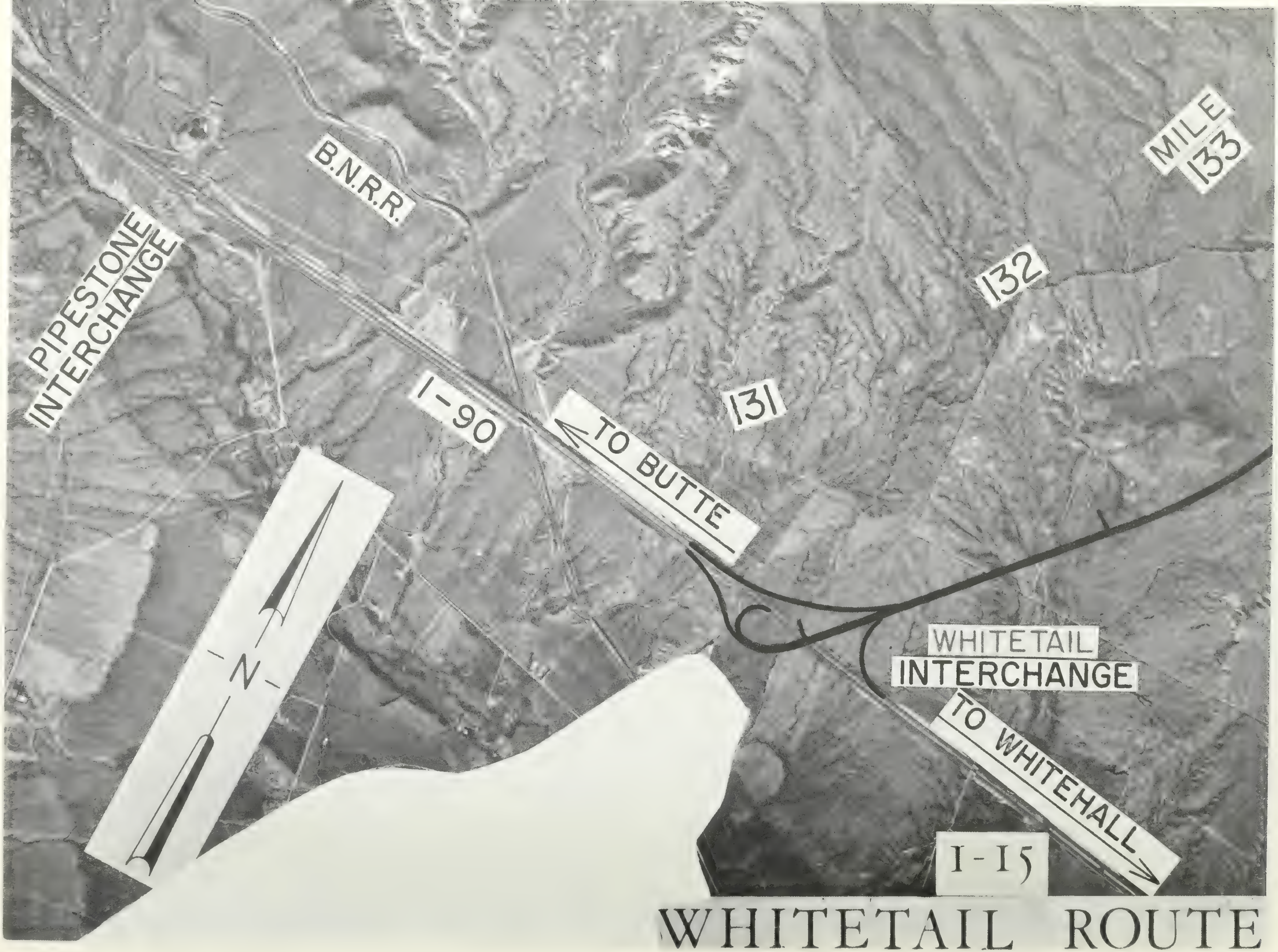
I-15 COMMON WITH I-90



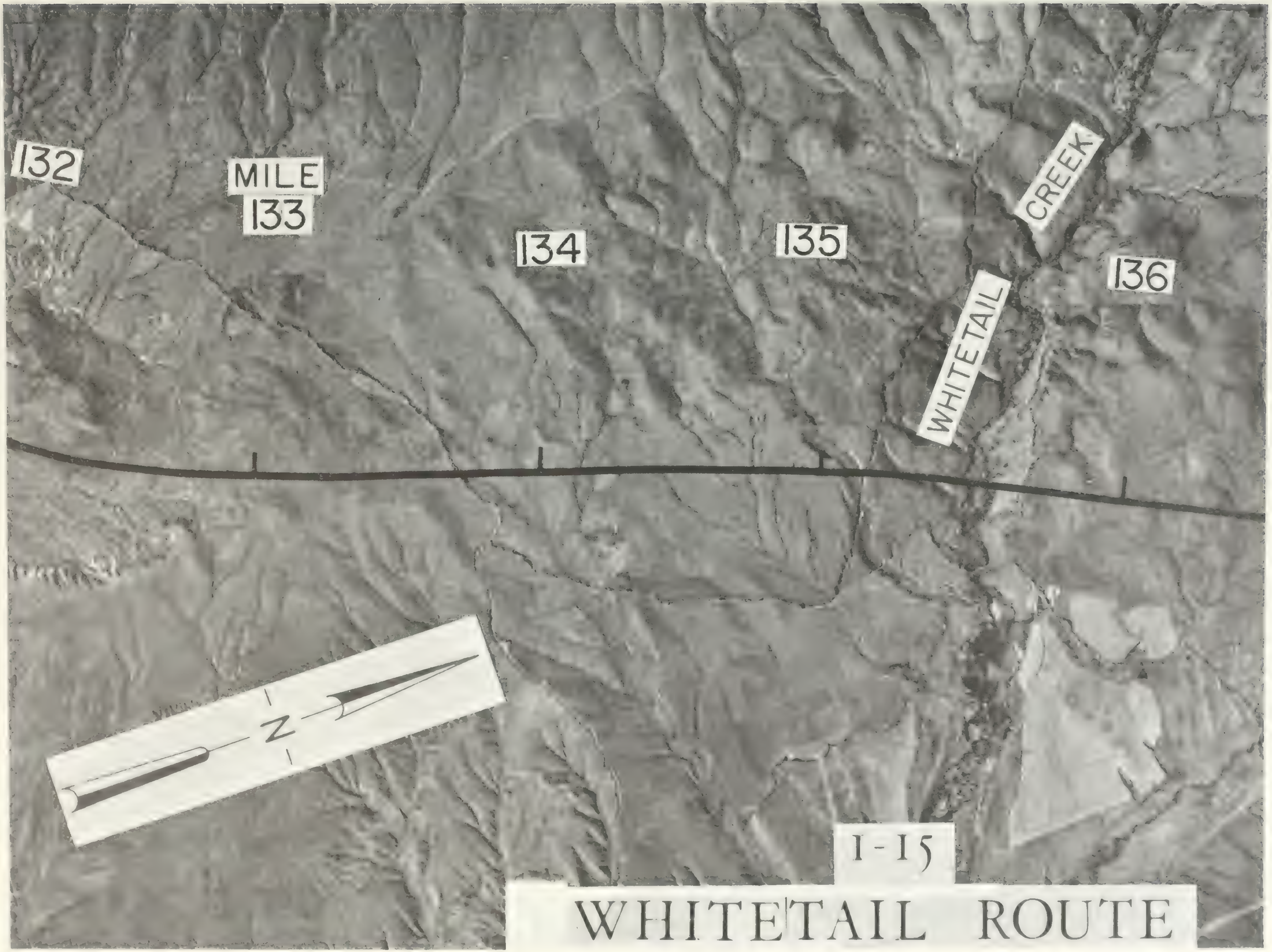
I-15
WHITETAIL ROUTE

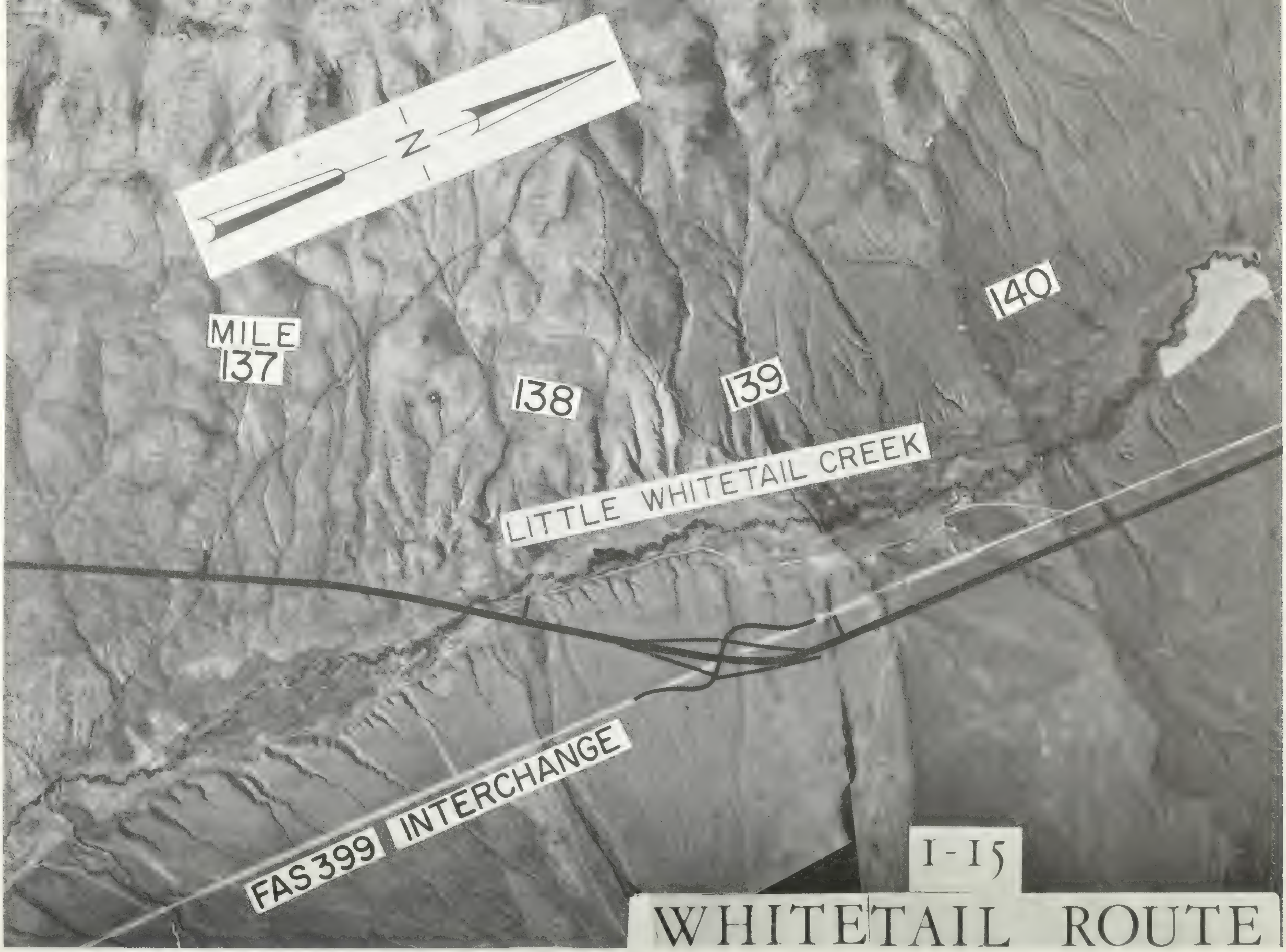
BUTTE – PIPESTONE

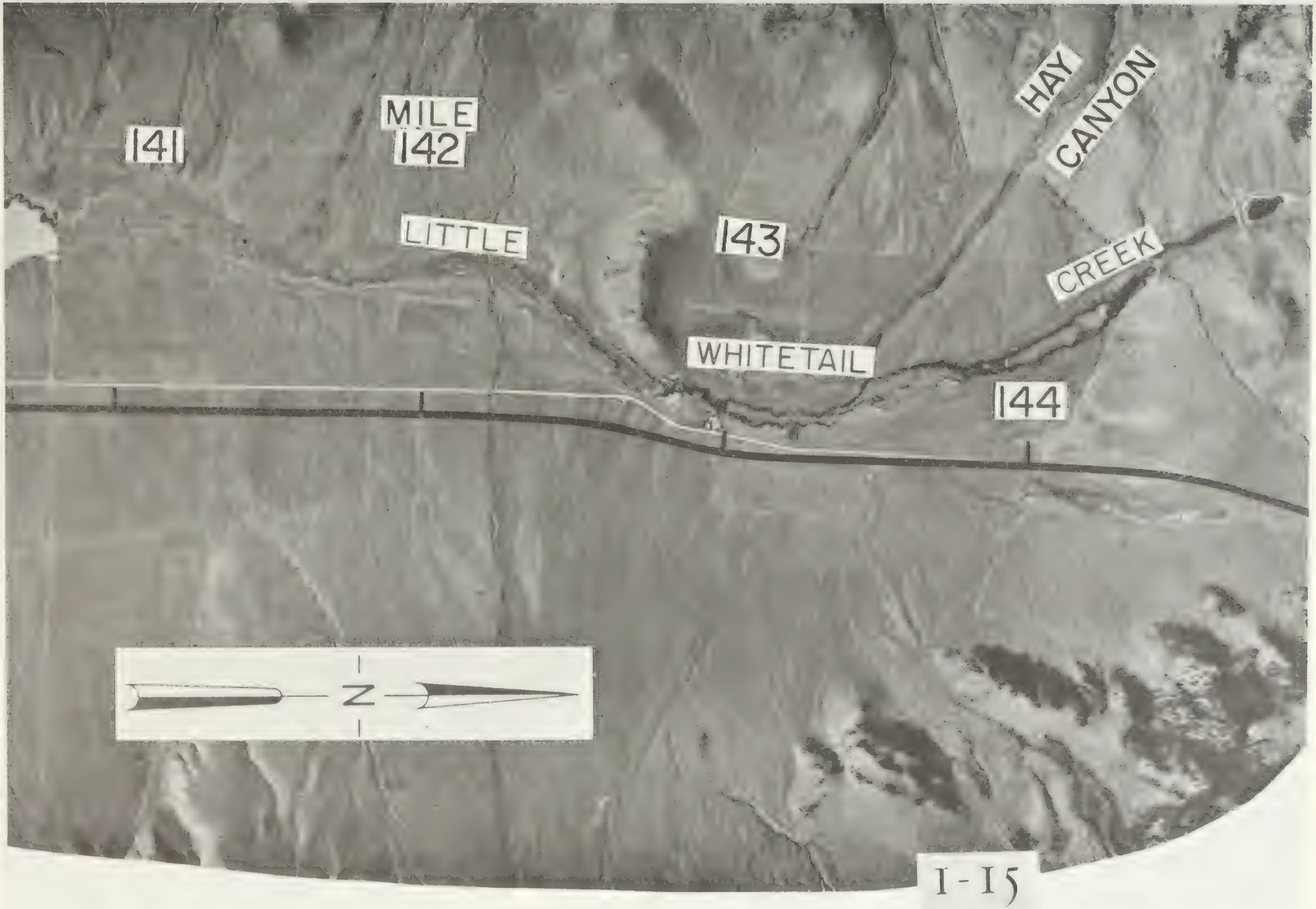
I-15 COMMON WITH I-90



WHITETAIL ROUTE

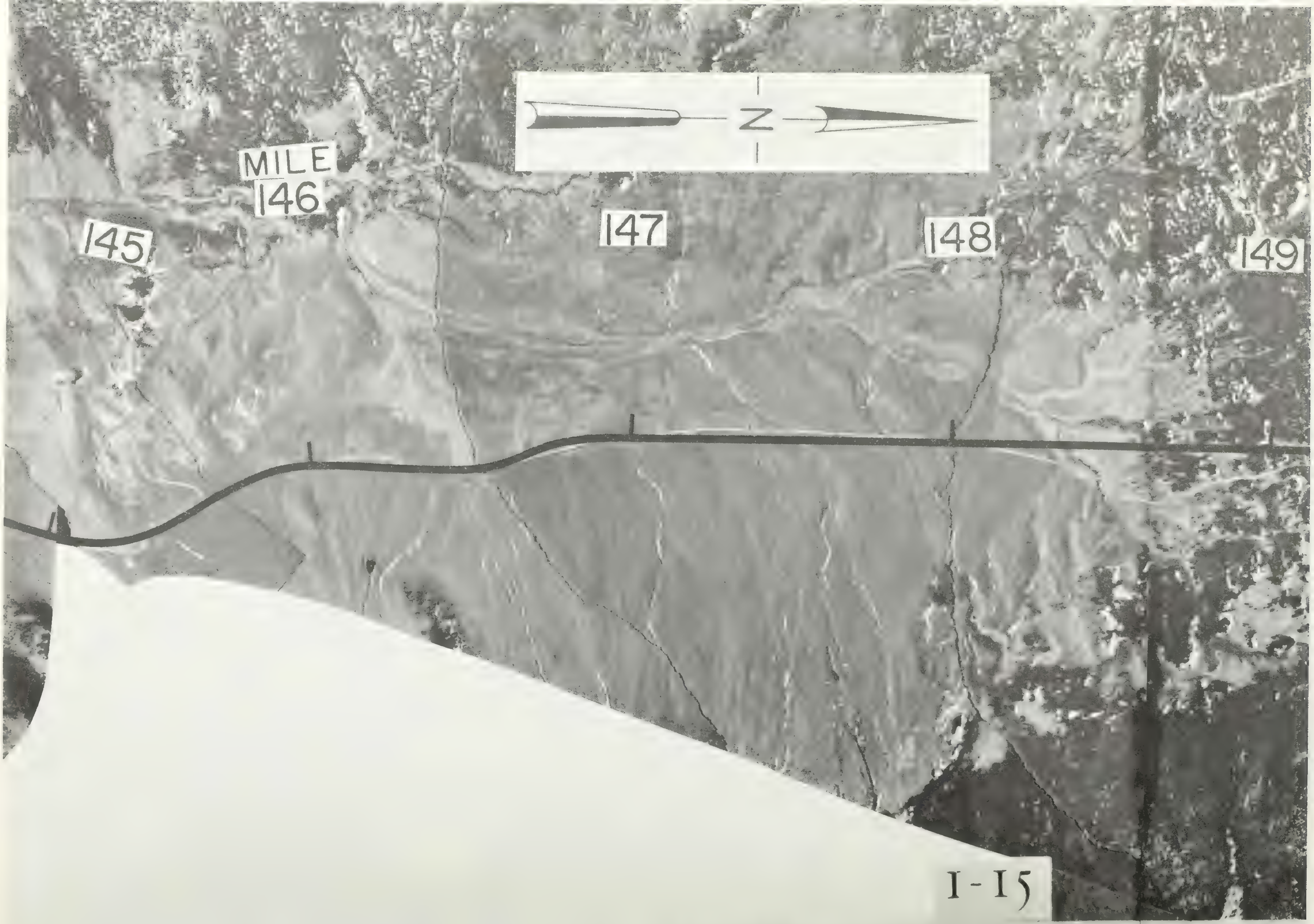

132
MILE
133
134
135
WHITETAIL
CREEK
136
N
I-15
WHITETAIL ROUTE


N
MILE
137
138
139
140
LITTLE WHITETAIL CREEK
FAS 399 INTERCHANGE
I-15
WHITETAIL ROUTE

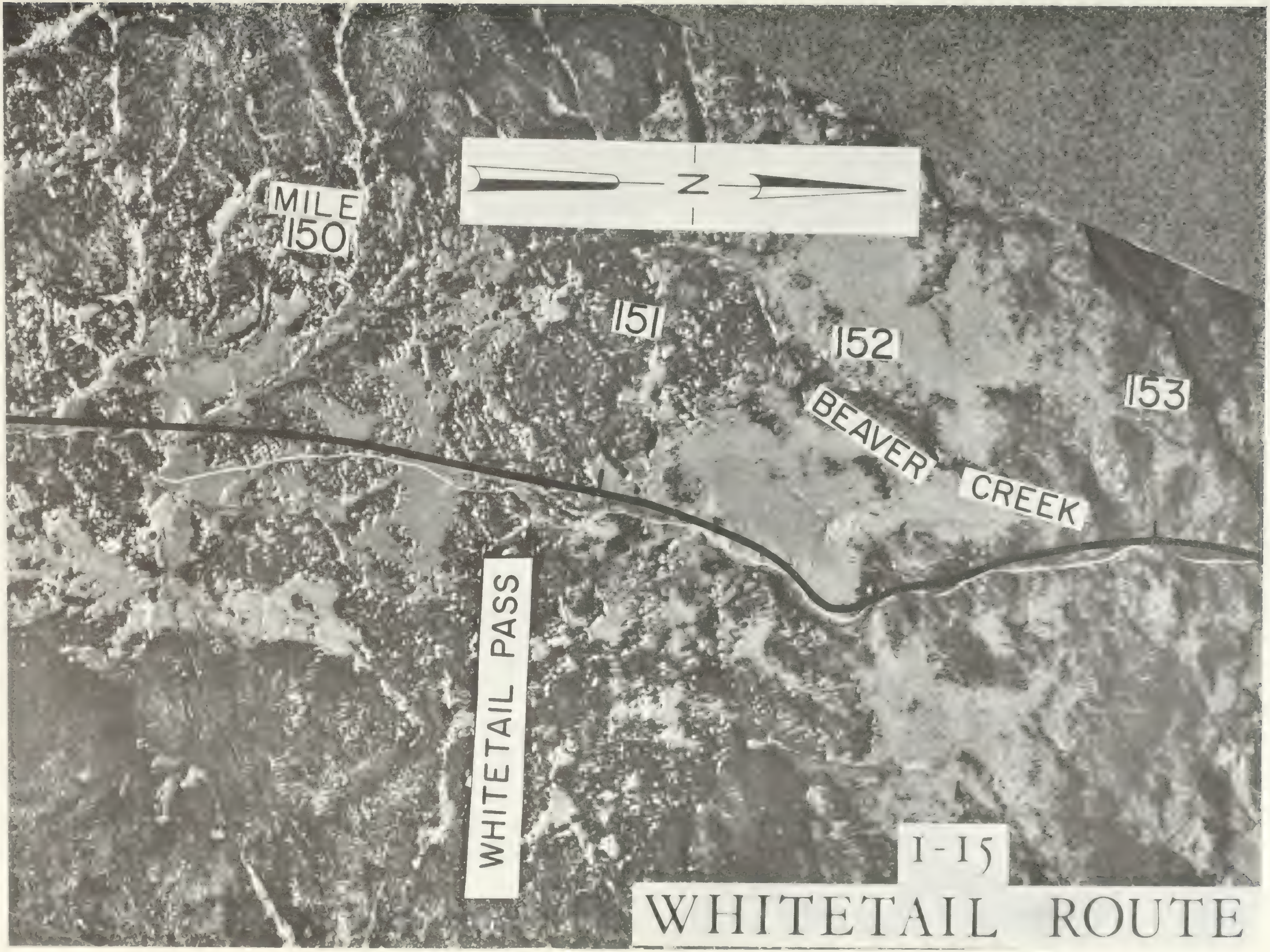


I-15

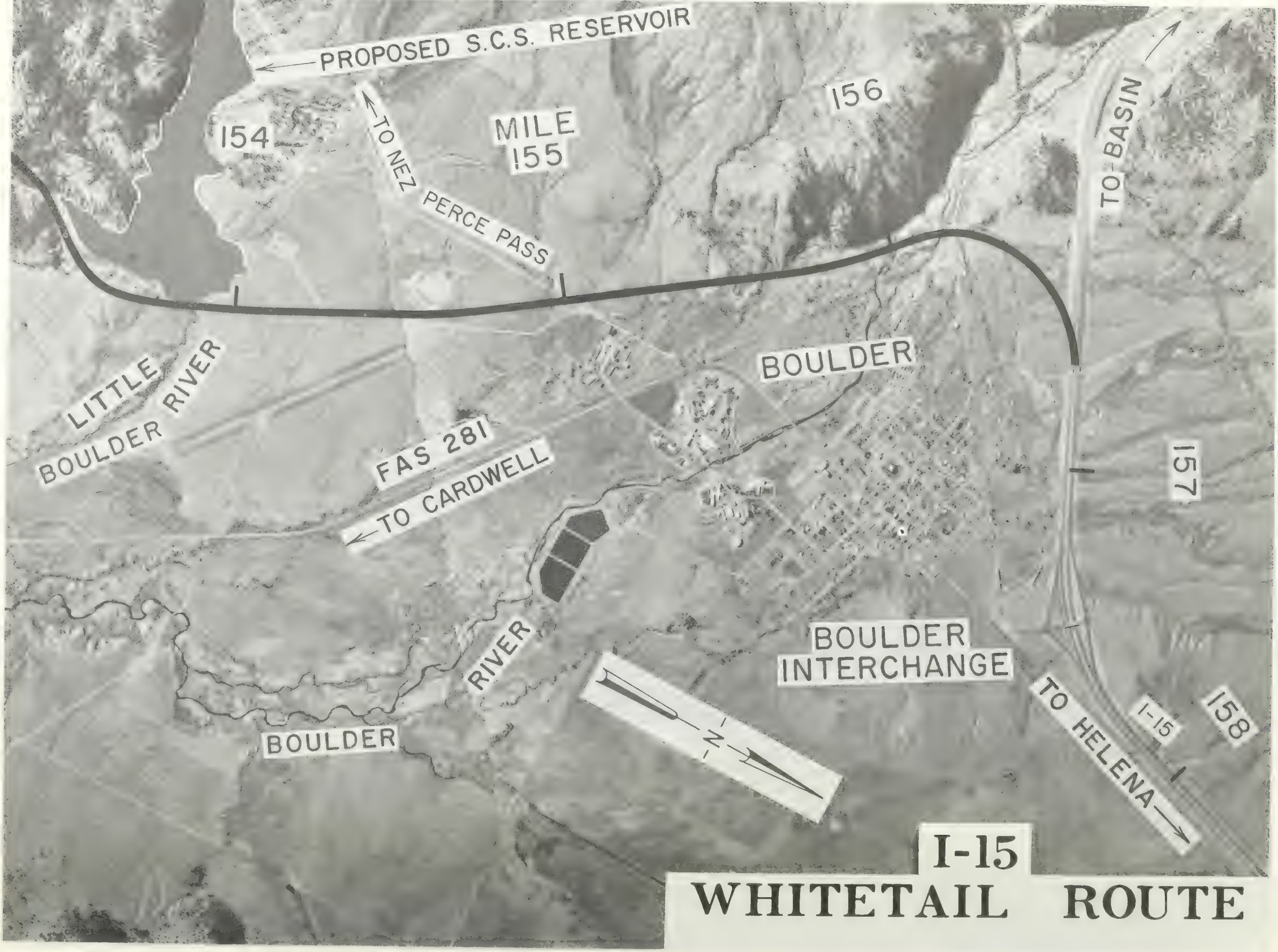
WHITETAIL ROUTE



WHITETAIL ROUTE



I-15
WHITETAIL ROUTE



I-15 WHITETAIL ROUTE

ALTERNATE 4 - BOULDER VALLEY ROUTE.

From the East Butte Interchange common point to the previously discussed Whitetail Interchange this route would be identical with that of the Whitetail route in that it would be common with I-90 which crosses Homestake Pass on steep grades and sharp curvature. It would continue to be common with I-90 to a point about six miles east of Whitehall where a new interchange would be provided to connect I-90 and I-15 without direct access to local roads at this site. Here at Mile 127 this route would turn north and climb on 5% grades and slight curvature for about ½ mile to reach the higher elevation of the bench lands of the west side of the Boulder Valley. The lanes here and for the full length of the route would have a distance of 100 feet between centerlines of parallel lanes.

This route then continues north crossing the foothills which are cut by many gulches, some of which are of considerable size.

The terrain changes in character at about Mile 135 to that of flat grassland with a gentle cross slope. An interchange would be provided here to provide access to properties along the Nigger Hollow road. From Mile 133 to Boulder the grades are slight and the alignment is essentially tangent. Another interchange would be built at Elk Horn Road near Mile 151 and in this area the roadway would make its only crossing of the Boulder River on a bridge. Here the roadway crosses to the east side of the valley again traversing low foothills. The East Boulder Interchange is planned at Mile 157 and at Mile 158 the road would tie into existing I-15 just north of the Boulder Interchange. A grade separation would permit continued use of the Interstate and interchange that has been constructed on the north side of Boulder.

The Boulder Valley is wide with irrigated hay lands in the bottom near the river and grazing land in the low foothills. Several cattle ranches are located along this corridor.

Flows in this section of the Boulder River are in the range of 250 cubic feet per second (cfs) during summer months and reach peaks of 3500 cfs.

The existing Boulder Valley highway (FAS 281) would be undisturbed by the new Interstate alignment to the west and would serve as a continuous frontage road. No road is planned on the west of the Interstate and this area would have to be served by grade separations or frontage roads as determined from local needs. Local access on the east side of the Interstate north of the Elkhorn Interchange would be perpetuated through use of the present road as a frontage road.

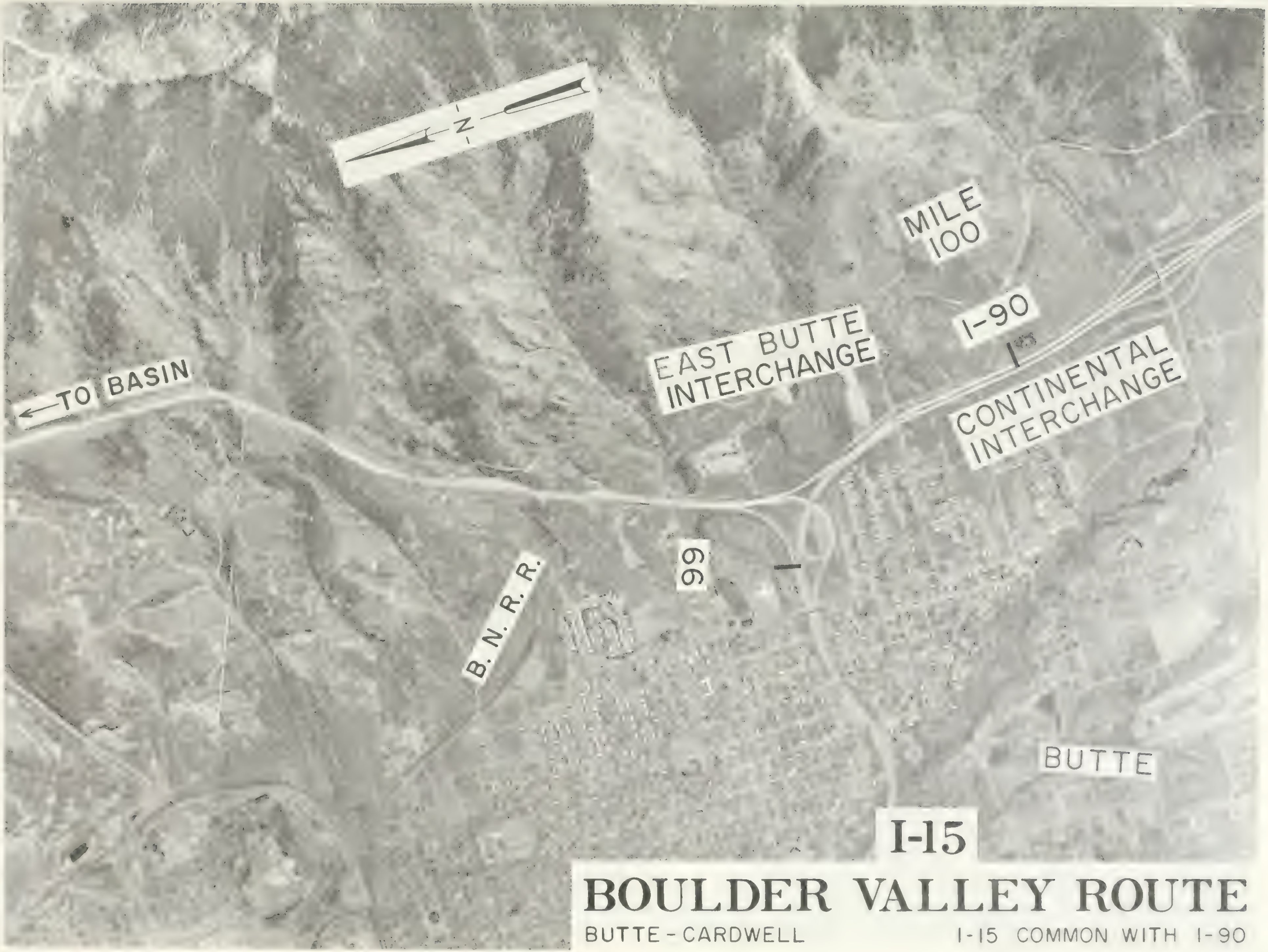
SECTION 4(f) LANDS Along the Boulder Valley Route

The only public lands involved with this corridor are two tracts administered by the Bureau of Land Management. There are no campgrounds or other facilities for public use along this route corridor.

DE FACTO SECTION 4(f) LANDS Along the Boulder Valley Route

There are two cabins in the mountains west of the route corridor. Access to these sites would be perpetuated.

Some hunting and fishing occurs on private land along the Boulder River and access to these properties would remain unchanged since existing FAS 281 would remain as a frontage road.

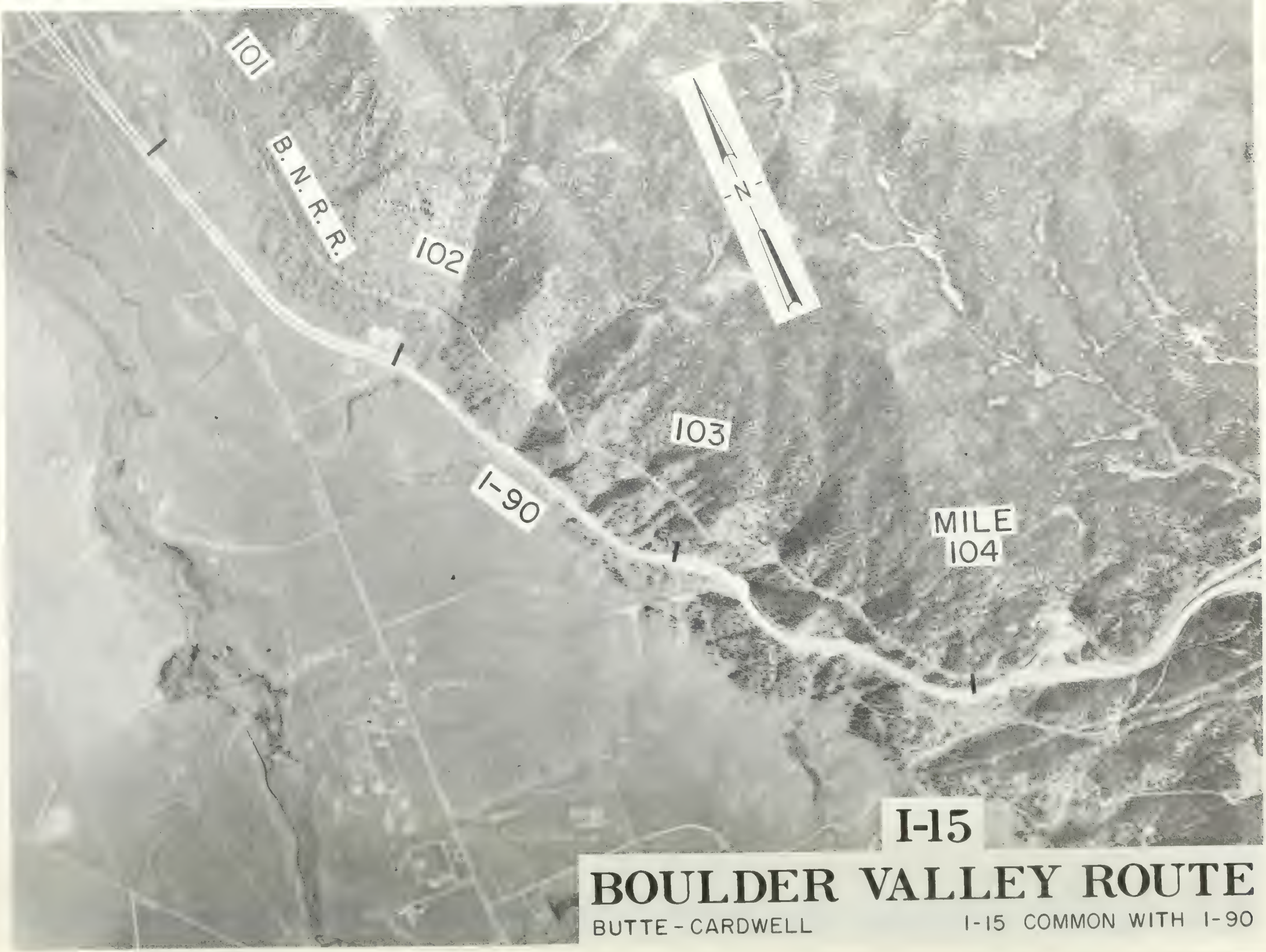


I-15

BOULDER VALLEY ROUTE

BUTTE - CARDWELL

I-15 COMMON WITH I-90

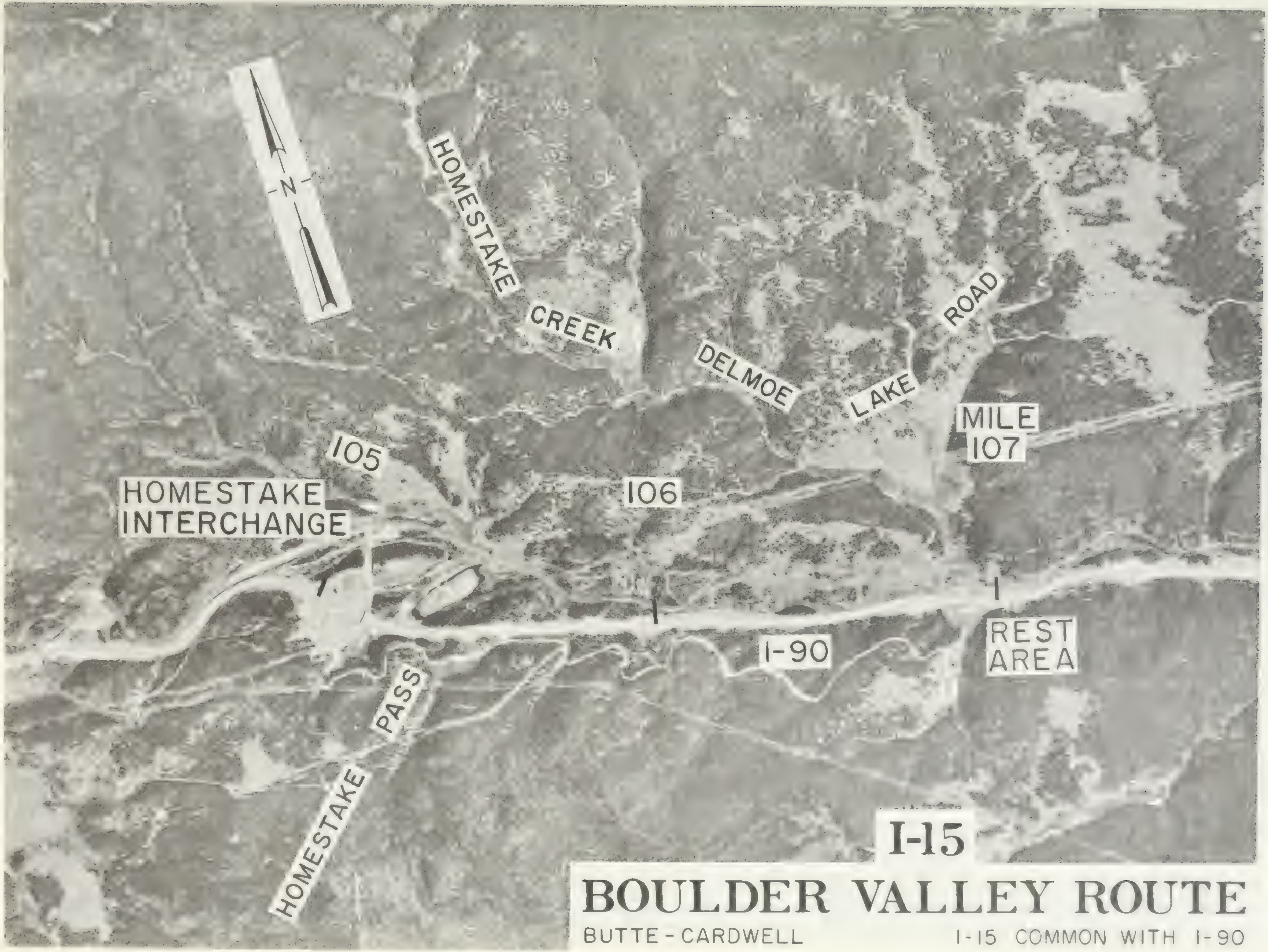


I-15

BOULDER VALLEY ROUTE

BUTTE - CARDWELL

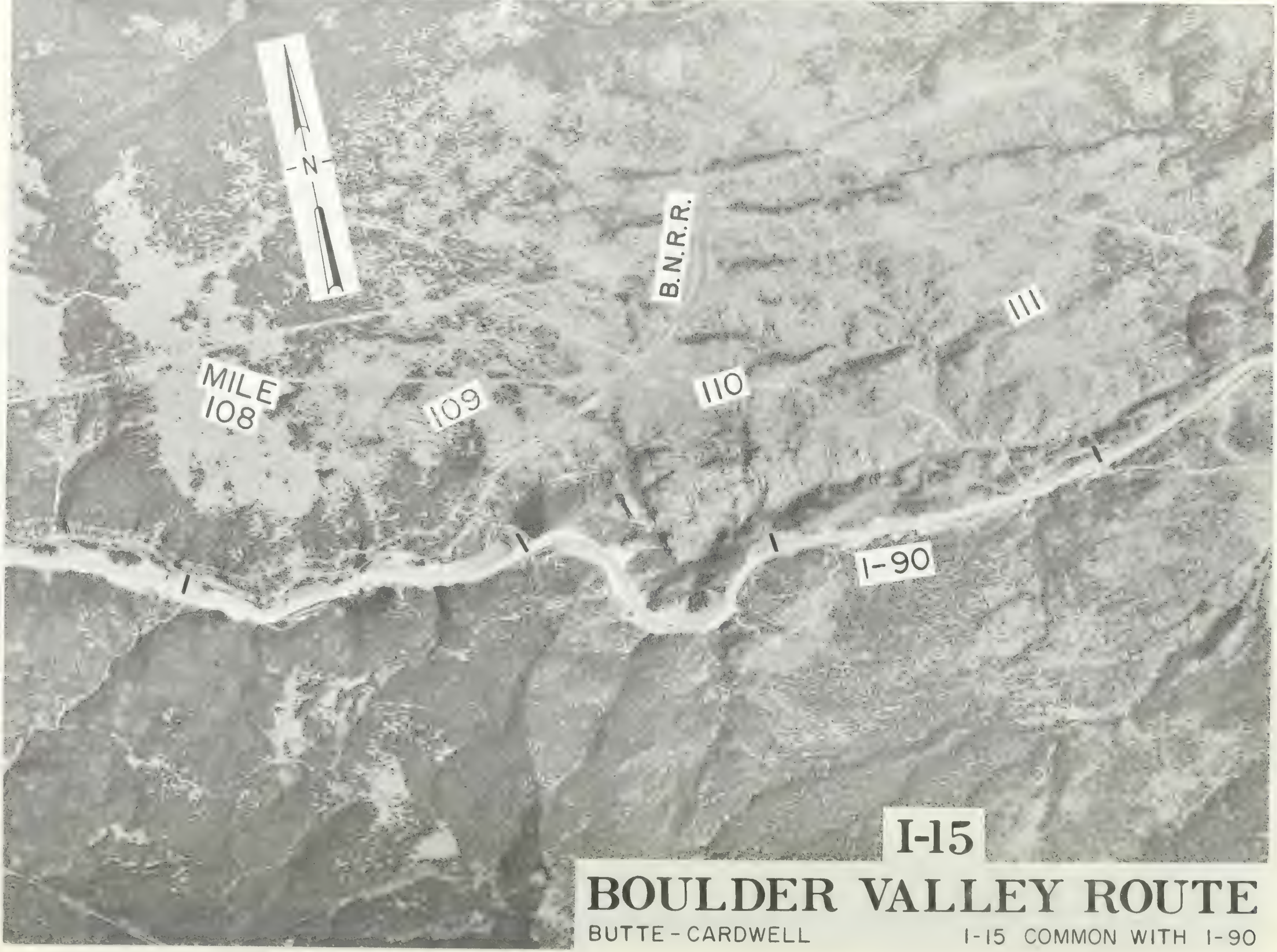
I-15 COMMON WITH I-90



I-15
BOULDER VALLEY ROUTE

BUTTE - CARDWELL

I-15 COMMON WITH I-90

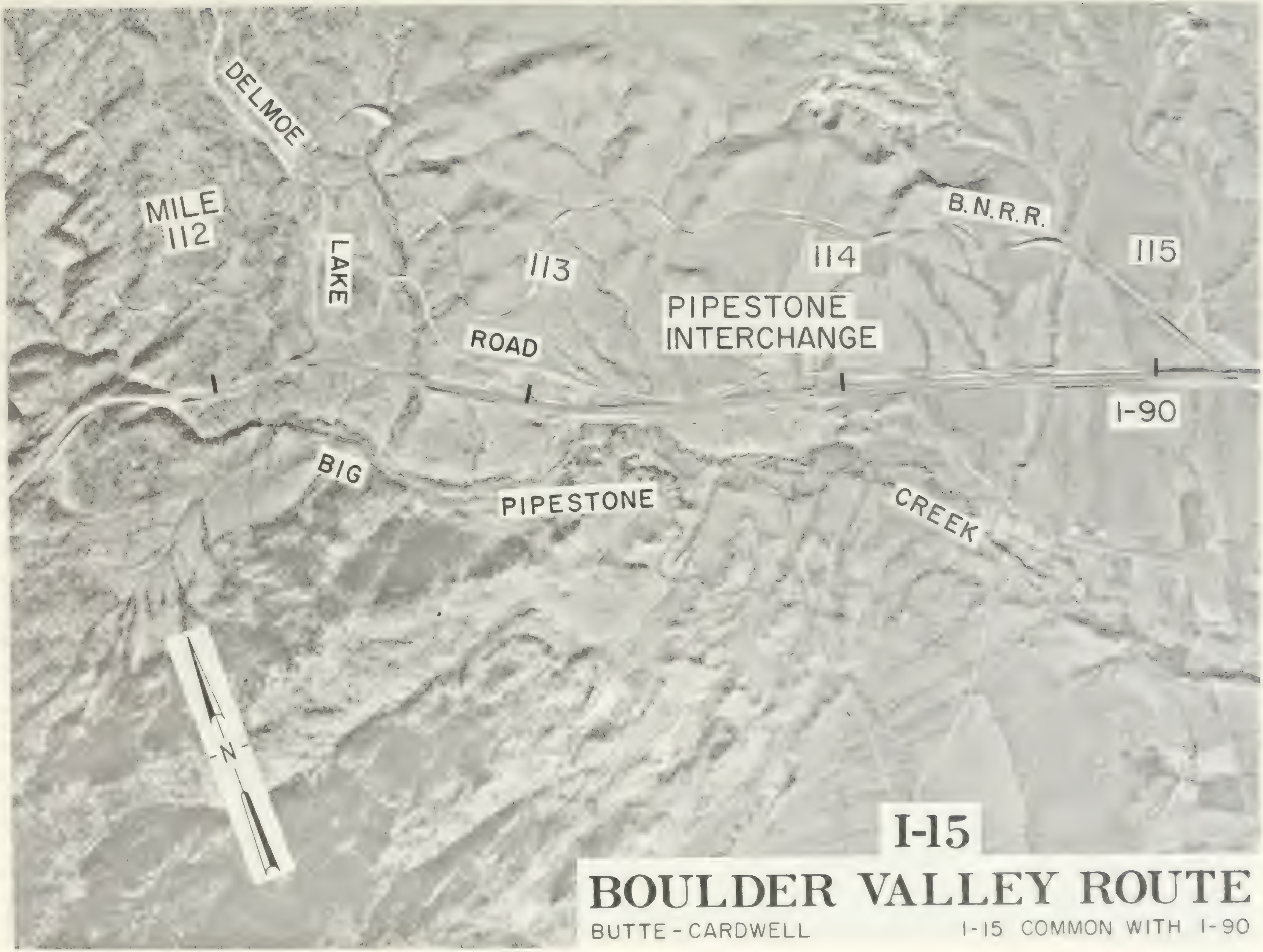


I-15

BOULDER VALLEY ROUTE

BUTTE - CARDWELL

I-15 COMMON WITH I-90

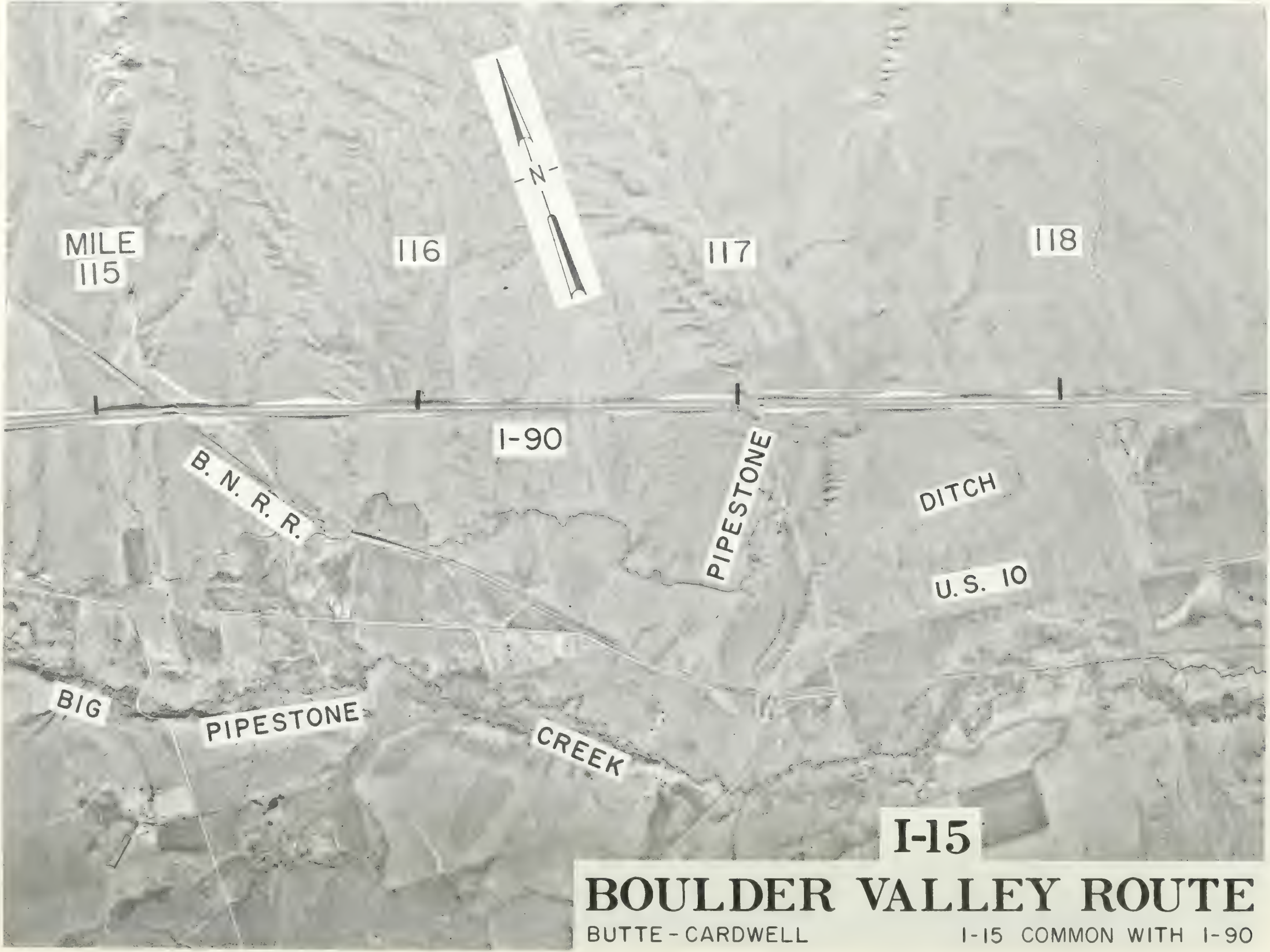


I-15

BOULDER VALLEY ROUTE

BUTTE - CARDWELL

I-15 COMMON WITH I-90

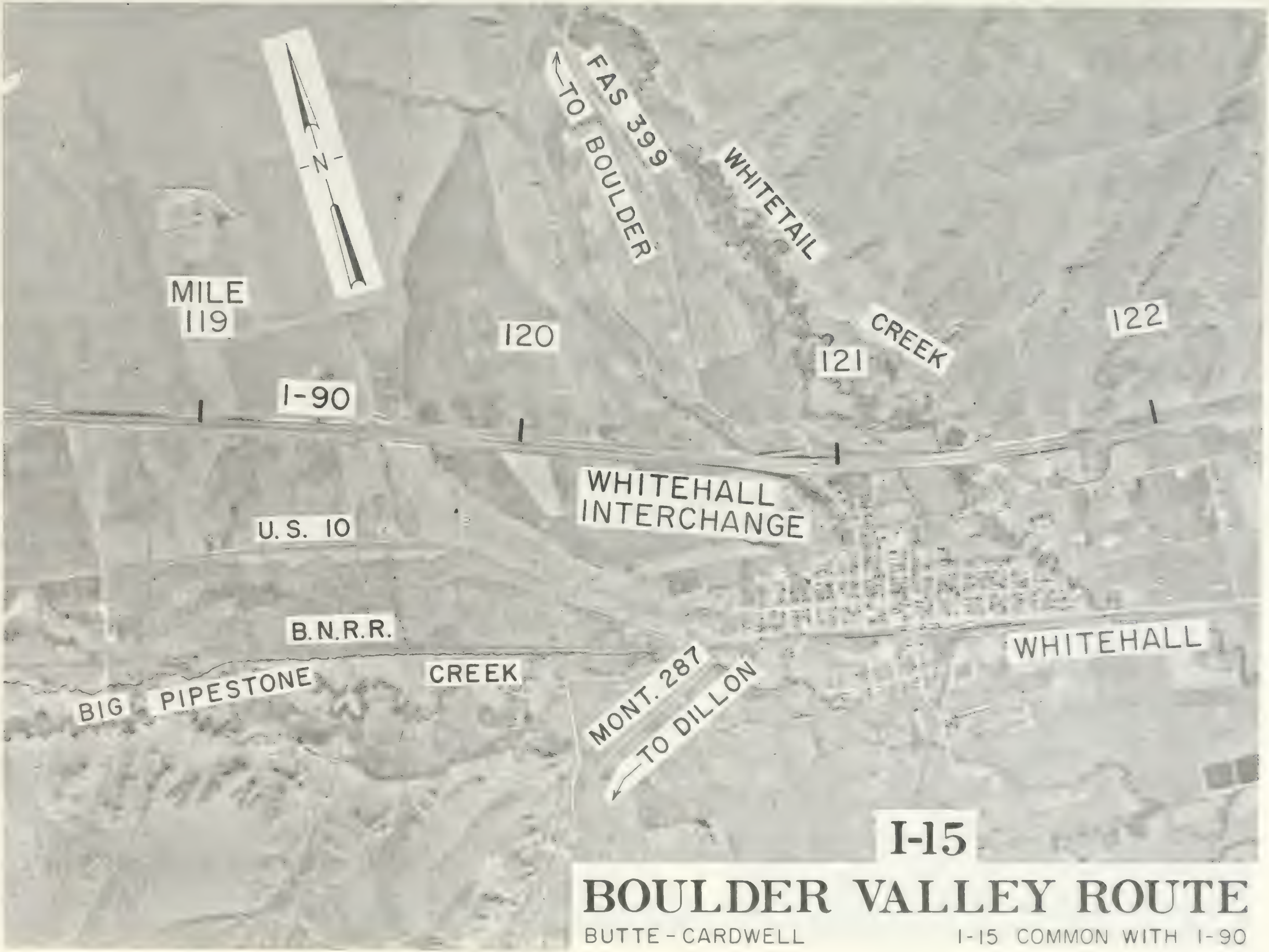


I-15

BOULDER VALLEY ROUTE

BUTTE - CARDWELL

I-15 COMMON WITH I-90

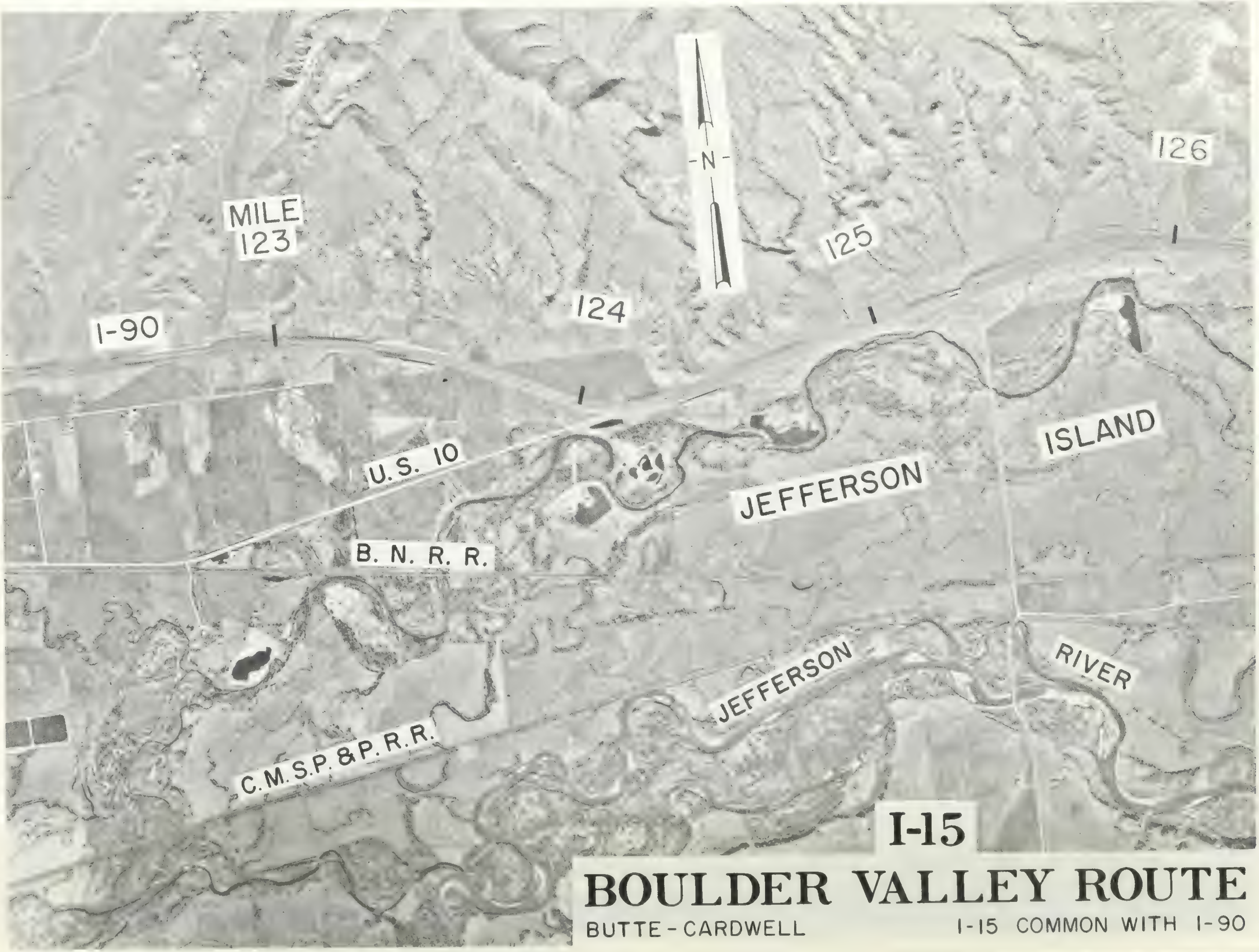


I-15

BOULDER VALLEY ROUTE

BUTTE - CARDWELL

I-15 COMMON WITH I-90

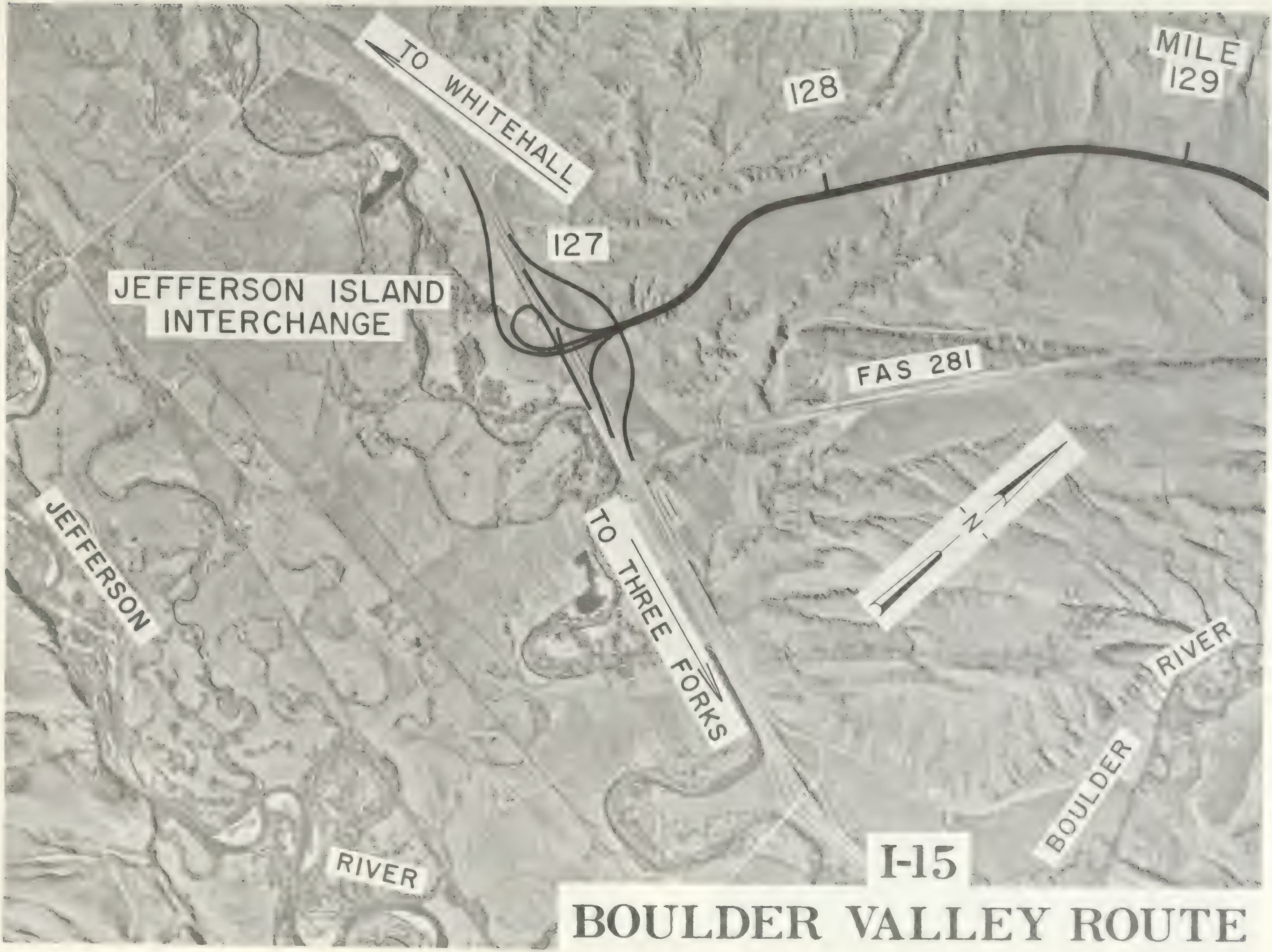


I-15

BOULDER VALLEY ROUTE

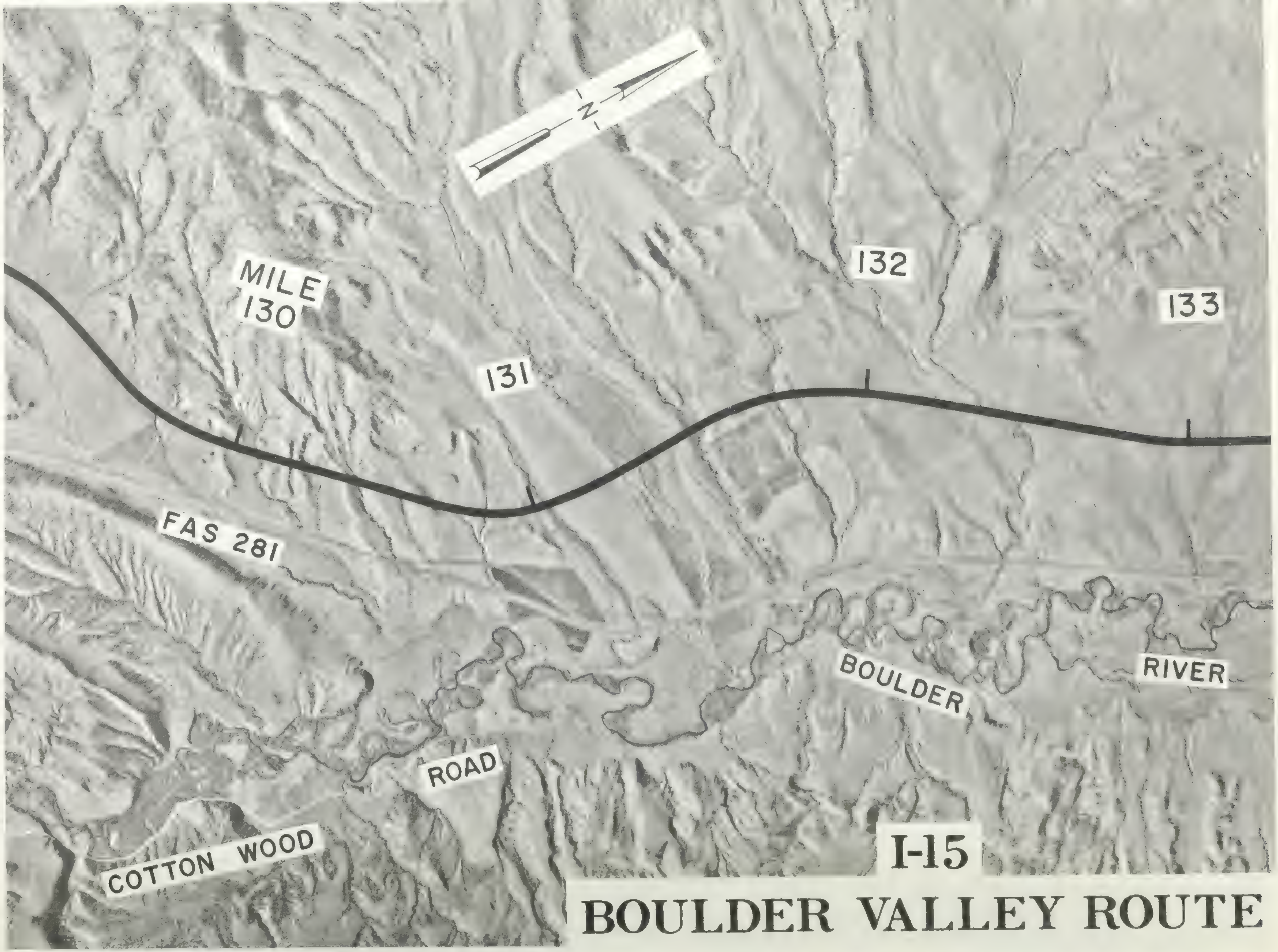
BUTTE - CARDWELL

I-15 COMMON WITH I-90

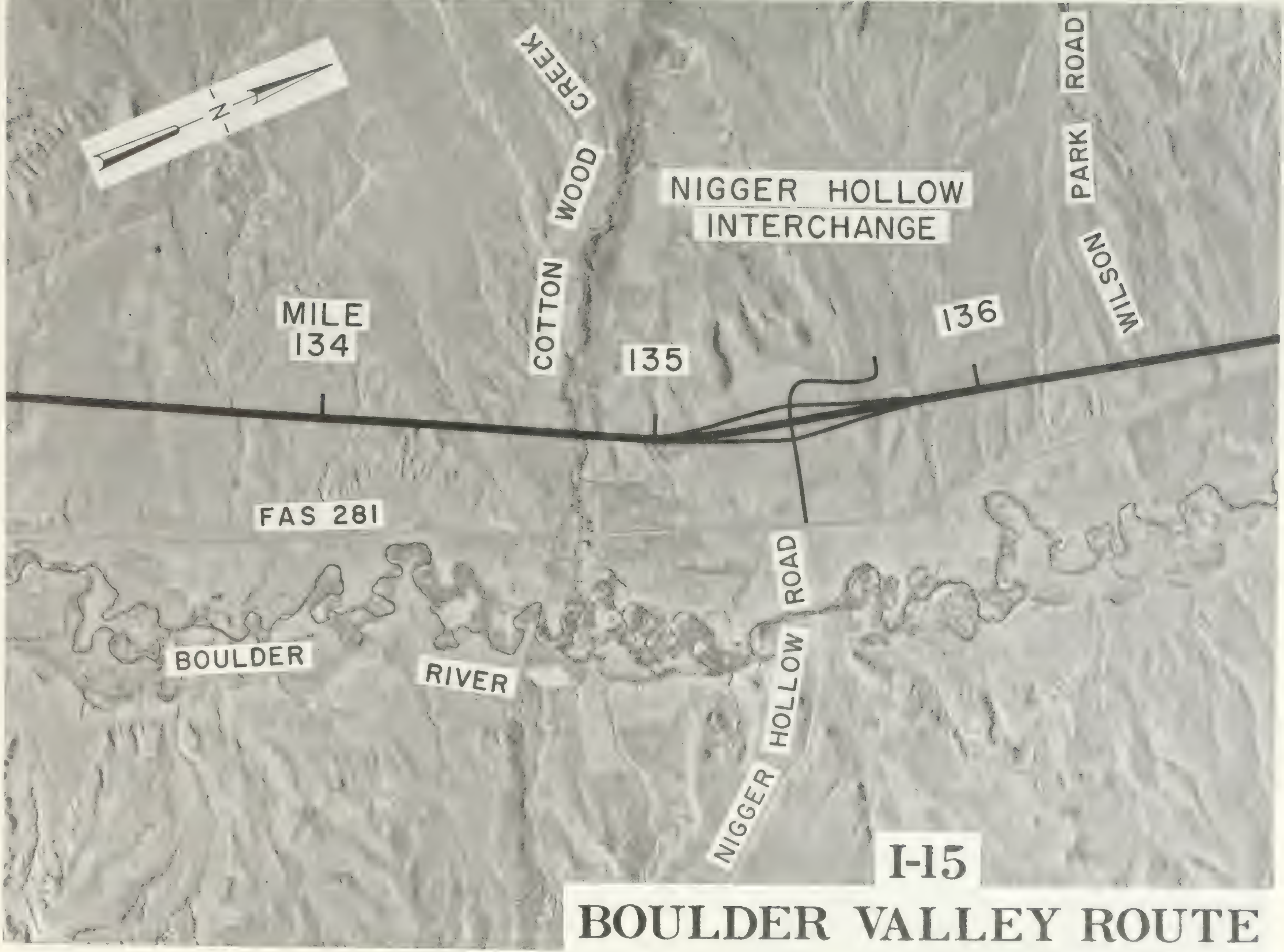


I-15

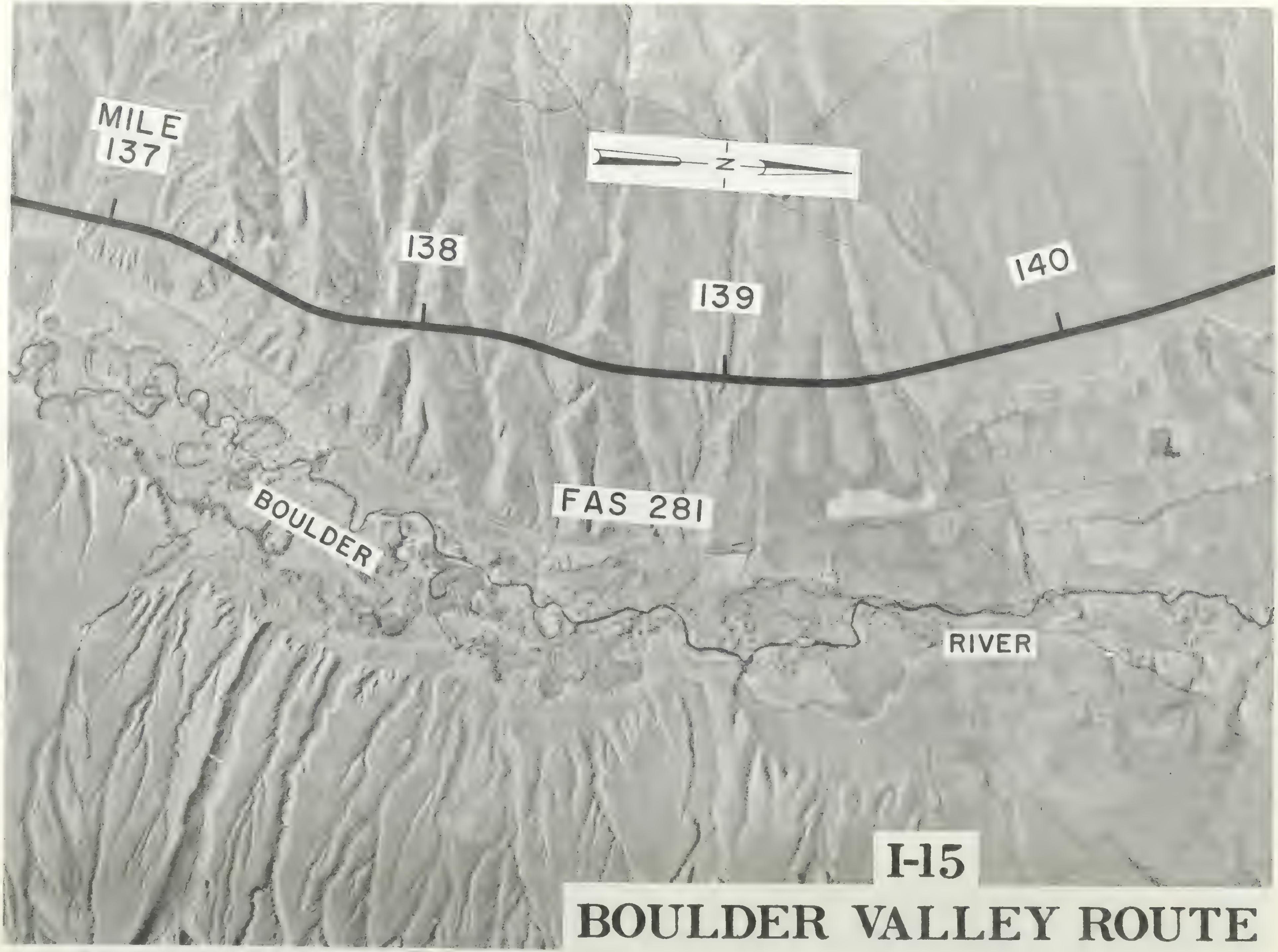
BOULDER VALLEY ROUTE



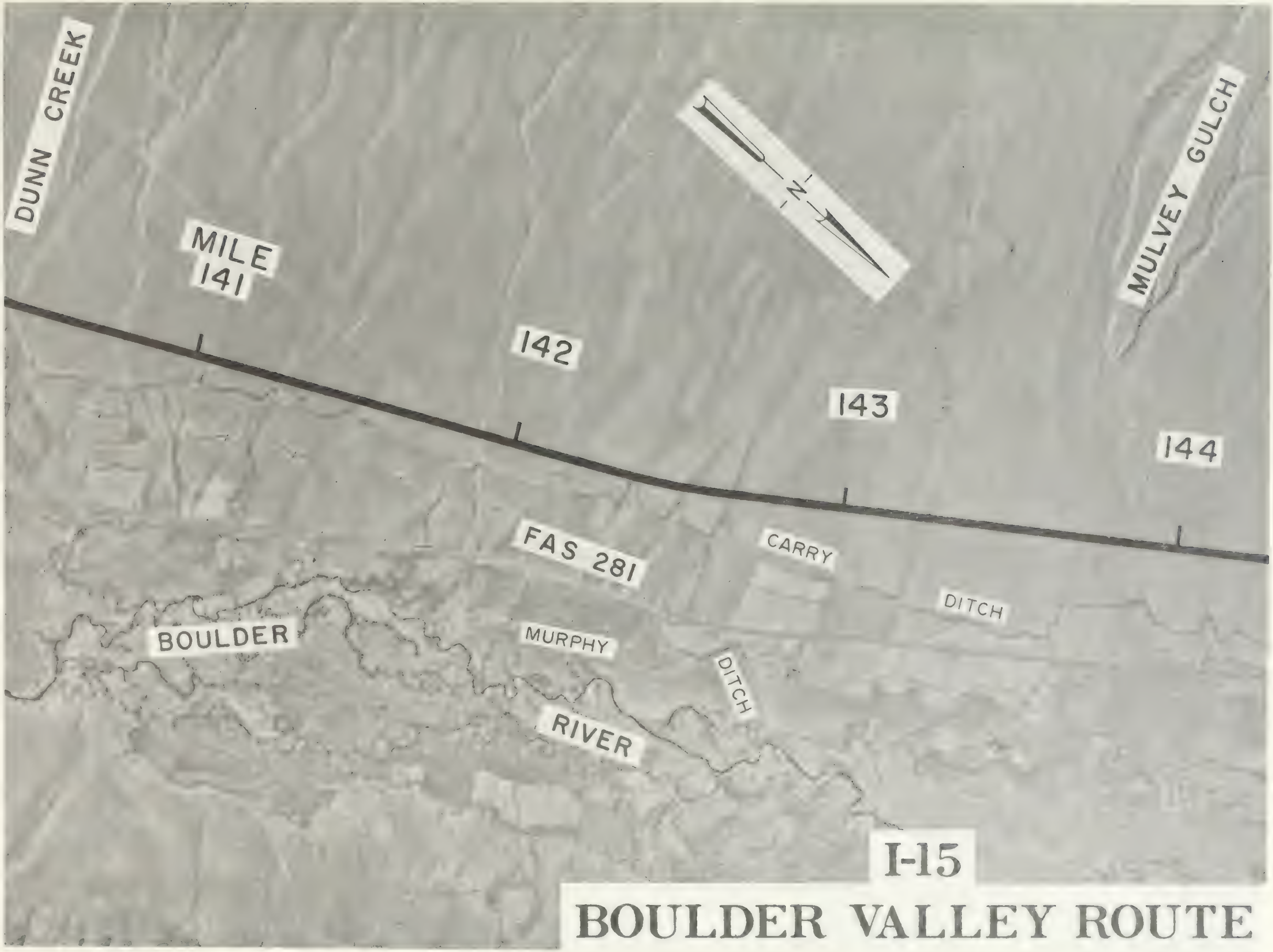
I-15
BOULDER VALLEY ROUTE



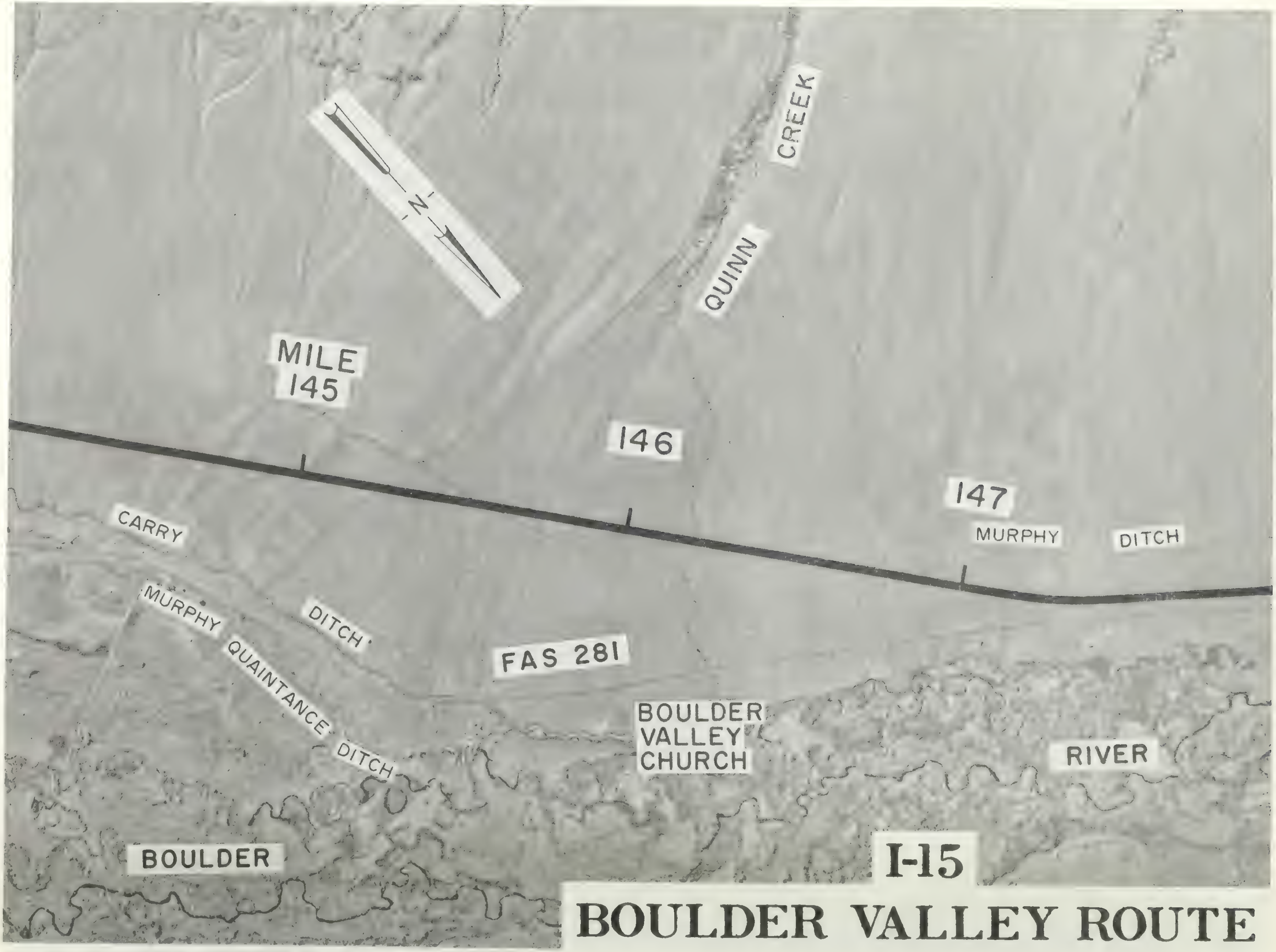
I-15
BOULDER VALLEY ROUTE



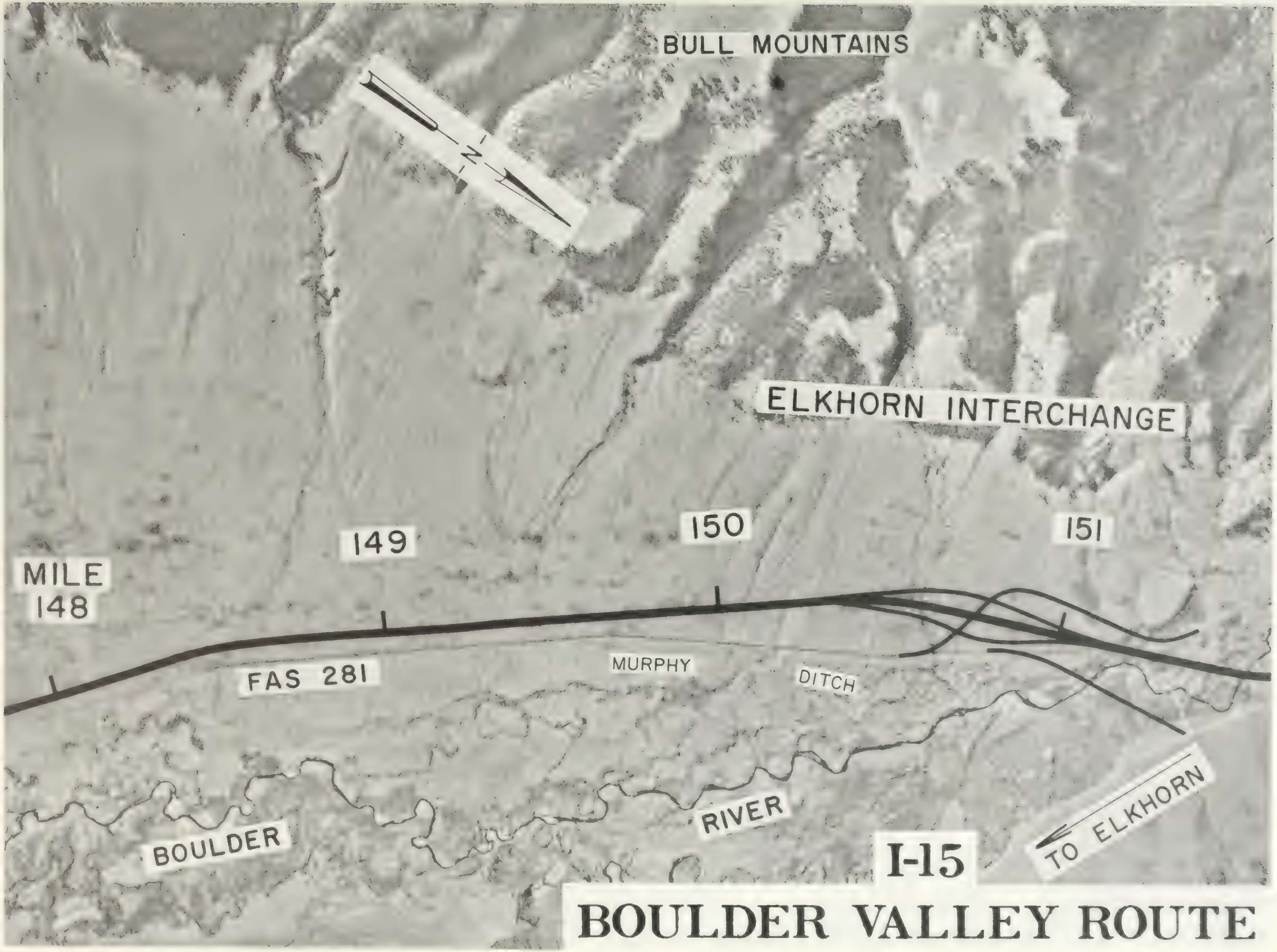
I-15
BOULDER VALLEY ROUTE



I-15
BOULDER VALLEY ROUTE



I-15
BOULDER VALLEY ROUTE



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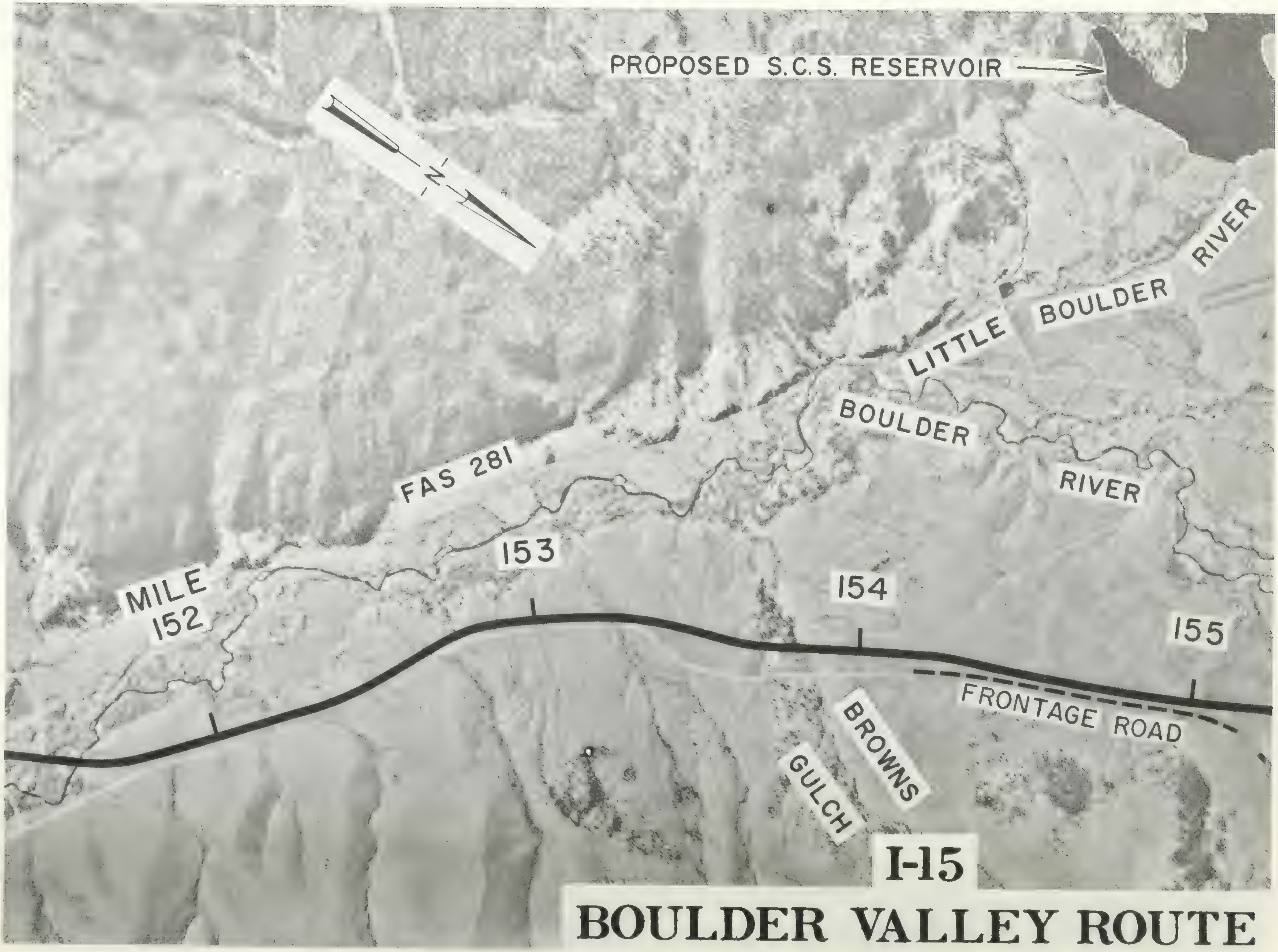
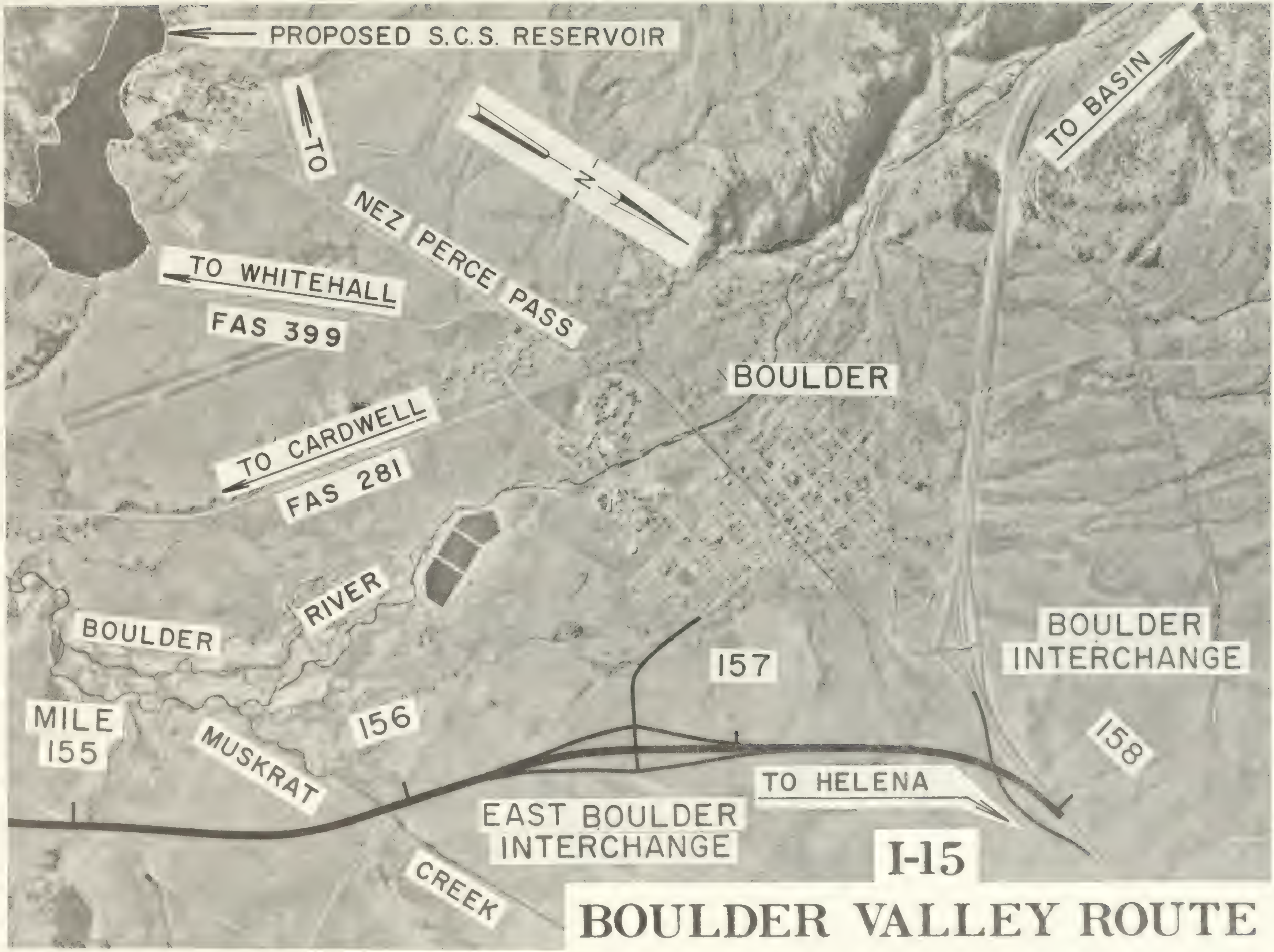
BOULDER VALLEY ROUTE



I-15
BOULDER VALLEY ROUTE



I-15

BOULDER VALLEY ROUTE

Alignment Comparisons of Alternate Routes

Table 1 summarizes the lengths of three different design speed classes of horizontal curvature for each of the four alternate routes. The figures include the total route length between Butte and Boulder and they include curvature on Interstate 90 where appropriate.

Table 2 indicates lengths of roadway within five ranges of steepness of profile grade. It too includes total route lengths between common termini.

Figure 6 is a graphic representation of the comparison of profile grade steepness, mountain pass elevations, adverse grade and route length.

SUMMARY OF LENGTHS OF HORIZONTAL CURVES

Degree of Curve Range	LENGTHS IN MILES			
	Basin Route	Nez Perce Route	White-tail Route	Boulder Valley Route
70 MPH * 0 to 3° 30'	29.3	25.4	40.2	54.7
60 MPH * 3° 30' to 5°	2.5	1.9	1.8	2.4
50 MPH * 5° to 7° 30'	3.8	1.3	2.1	1.6
Total Length	35.6	28.6	44.1	58.7

*Design Speed

TABLE 1

SUMMARY OF LENGTHS OF PROFILE GRADES

PROFILE GRADE RANGE	LENGTH IN MILES**			
	BASIN ROUTE	NEZ PERCE ROUTE	WHITE-TAIL ROUTE	BOULDER VALLEY ROUTE
6%	0.3	0.3	3.7	3.7
5%	3.3	14.5	8.5	5.2
4%	1.5	1.0	0.8	1.4
3%	4.6	3.1	6.3	3.8
2% and Under	25.9	9.7	24.8	44.6
TOTAL LENGTH	35.6	28.6	44.1	58.7

** INCLUDES PORTION ON INTERSTATE 90 COMMON WITH INTERSTATE 15 EAST OF BUTTE

TABLE 2

ROUTE LENGTH &

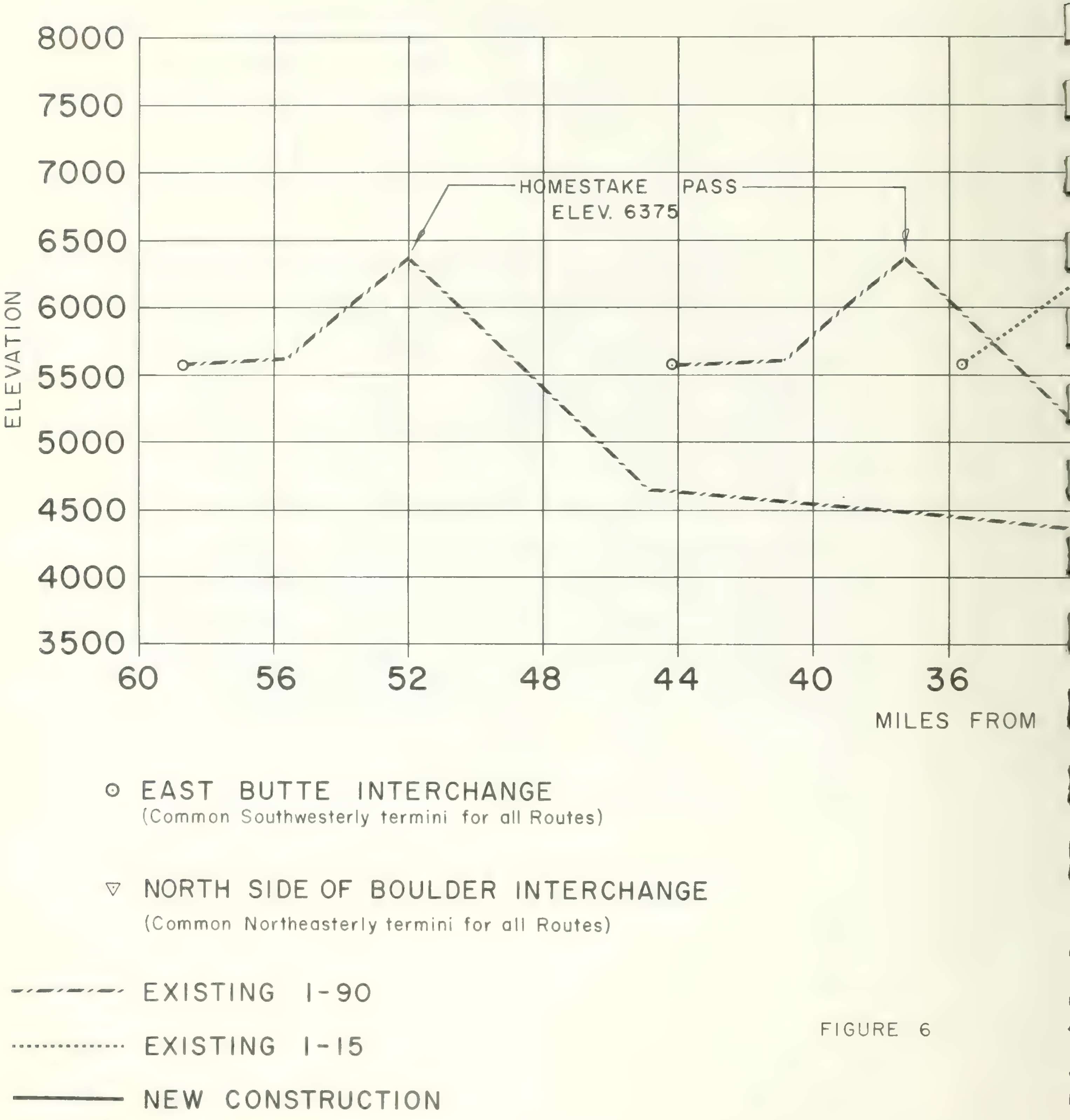
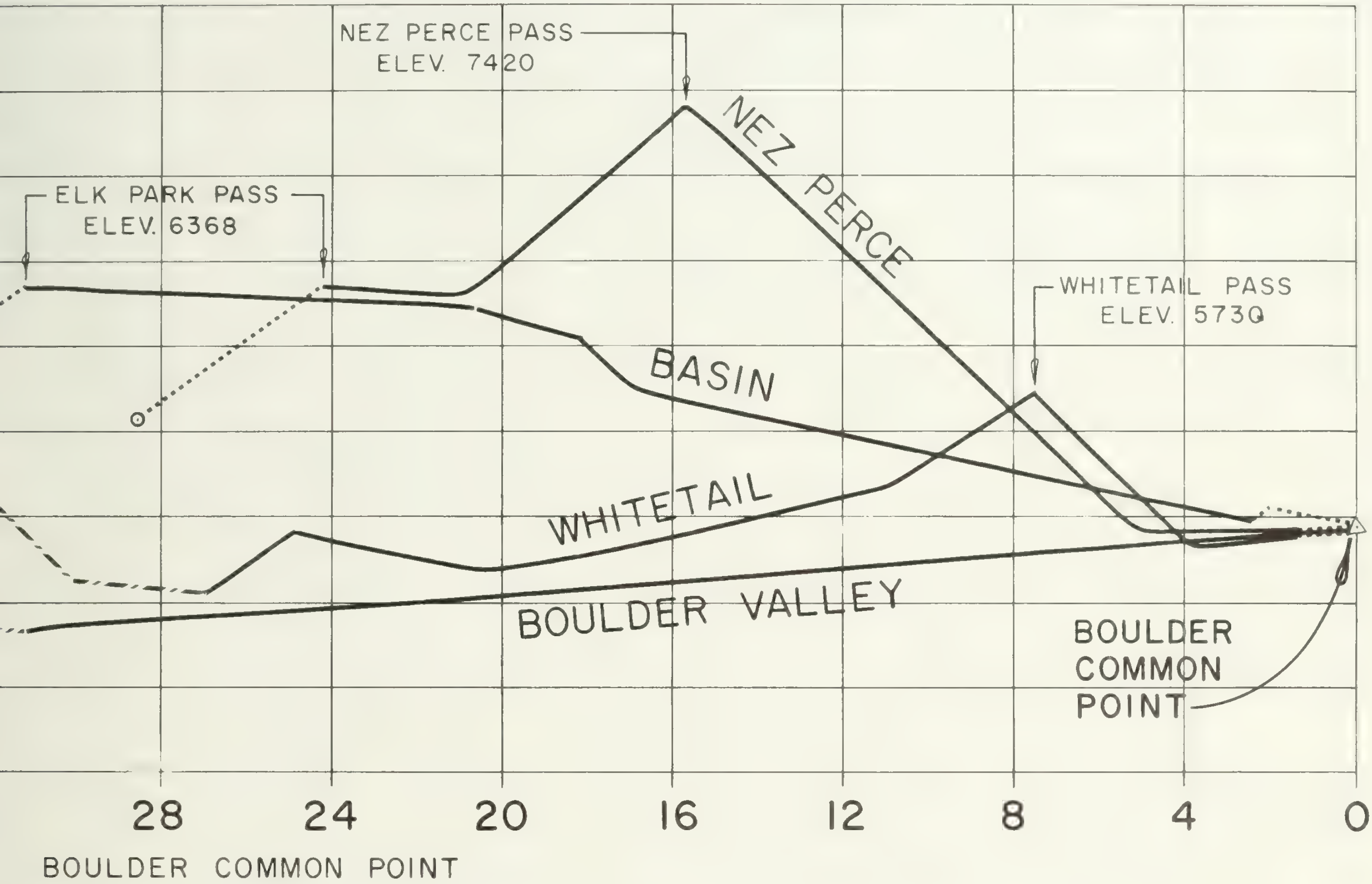
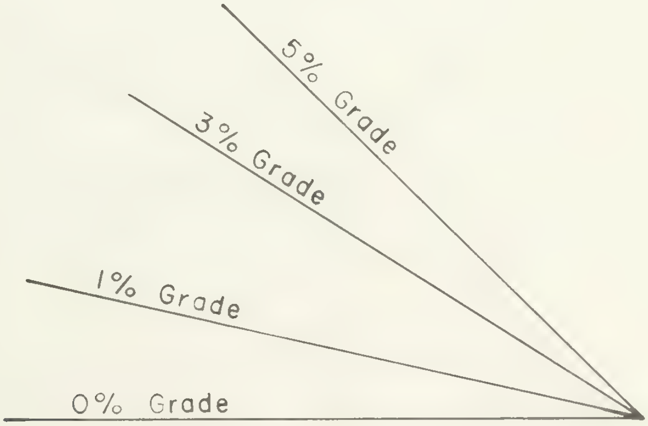


FIGURE 6

PROFILE GRADE COMPARISONS





GRADE STEEPNESS DIAGRAM

SECTION II

HIGHWAY ECONOMICS

MORRISON-MAIERLE, INC.
Consulting Engineers Helena, Montana

Page

SECTION II - HIGHWAY ECONOMICS

- ECONOMIC ANALYSIS OF TRANSPORTATION NETWORK ------------- 101
  - The Approach --- 101
    - Table 6 - Traffic Forecast Factors ------------ 102
    - Figure 7 - Area of Study for Traffic Assignment 103
    - Table 3 - 1970 Trip Table --------------------- 104 & 105
    - Table 4 - 1987 Trip Table --------------------- 106
    - Table 5 - 1997 Trip Table --------------------- 107
    - Figures 8 thru 12 - 1970, 1987, 1997 Traffic Assignments for Existing Roads & Each Alternate ------------------------------------ 108 to 112
    - Table 7 - Vehicle Operating Costs ------------- 114
    - Table 8 - Estimated Capital Construction Costs- 117
    - Table 9 - Cost of Completion Sections of I-15 - 118
    - Table 10 - Maintenance Costs ------------------ 119
    - Table 11 - Service Life of Highway Components - 119
    - Table 12 - Annual Construction Costs ---------- 120
    - Figure 13 - Travel Times and Distances -------- 121
    - Figures 14, 15 & 16 - Summary of Annual Transportation Costs ----------------------- 123 to 125
  - The Analysis --- 126
  - The Results -- 128
    - Impact Evaluation Chart ----------------------- 128
- REFERENCES --- 129

HIGHWAY ECONOMICS

ECONOMIC ANALYSIS OF TRANSPORTATION NETWORK

The Approach. The first step in developing the road user analysis was to determine the "area of influence" for the road user. This can be defined as the smallest area which considers all possible traffic movements which could be affected by the various alternate road networks under consideration. This is shown by the Regional analysis boundary on Figure 7, "Area of Study", and includes the region between Helena, to the north, and Dillon, to the south; and between Anaconda, to the west, and Three Forks, to the east.

Traffic volume assignments were developed for each of the four alternate road systems under consideration. An analysis was made of existing origin and destination surveys which had been taken within or near the area of influence. These included local and through trips as well as truck trips. Based on this analysis, a traffic assignment was made to the existing road network. These assignments wery then applied to each alternate route network and trips were diverted from existing roads to the Interstate routes for each alternate condition. The amount of traffic diverted is shown on Tables 3, 4 & 5. Trip assignments were made using the following assumptions.

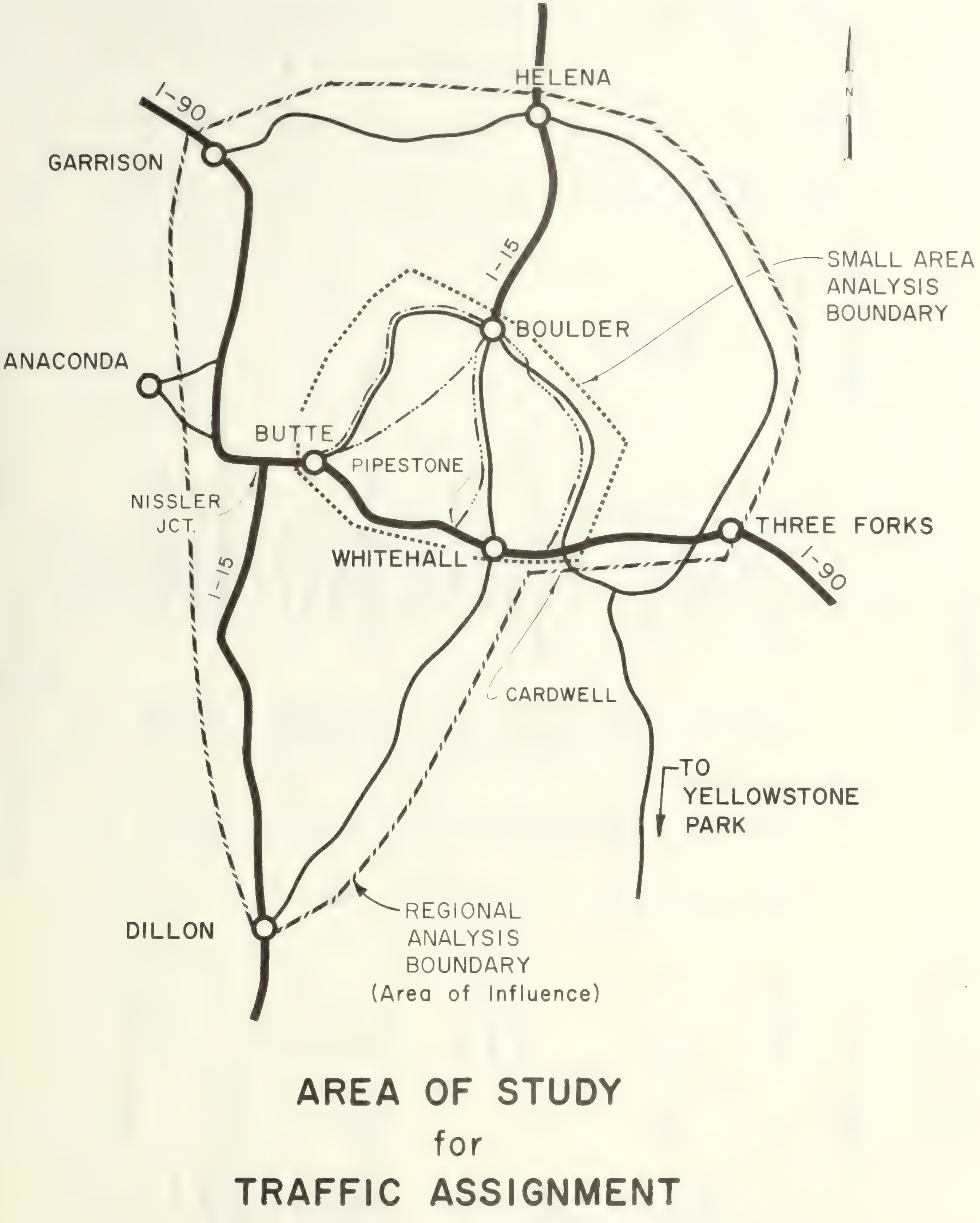
(1) Ninety percent of the travellers who were unfamiliar with the area would follow the Interstate 15 route, regardless of the time and distance considerations of other routes.

(2) Trucks, plus the remainder of cars, would be diverted to the various routes by a time and distance formula.

The resulting 1970 traffic volumes were then expanded using the factors shown in Table 6 to produce the estimated 1987 and 1997 figures which were then used in the transportation network analysis. The traffic volumes in vehicles per day (ADT - Average Daily Traffic) are shown on Figures 8 through 12.

TRAFFIC INCREASE FACTORS		
Road Type	YEARS	
	1987	1997
Interstate Traffic	1.79	2.08
Through Traffic	1.52	1.95
Local Traffic	1.40	1.71

TABLE 6



AREA OF STUDY
for
TRAFFIC ASSIGNMENT

FIGURE 7

1970 TRIP TABLE

Basin Rt. Alt. # 1

Trip	Diverted From	FPC	LPC	TR	Tot
Basin Rt. I-15					
Dillon-Helena		80	15	11	106
Helena-Butte		105	330	135	570
Anaconda-Helena		9	14	13	36
Butte-Boulder		23	131	7	161
Butte-Basin		10	51	4	65
Butte-Jefferson City		1	10	7	18
Butte-Local North		4	101	2	107
Dillon-Boulder	Mont. 41	0	3	0	3
Dillon-Helena	Mont. 41	36	15	6	57
Anaconda-Helena	U.S. 12	5	32	2	39
Total		273	702	187	1162
Boulder Valley FAS 281 Remaining					
Boulder Valley Local		12	128	17	157
Boulder Valley Thru		57	208	41	306
Total		69	336	58	463
Whitehall-Boulder FAS 399 Remaining					
Whitetail Thru		5	19	4	28
Whitetail Local		6	70	8	84
Total		11	89	12	112

Nez Perce Rt. Alt. #2

Trip	Diverted From	FPC	LPC	TR	Tot
Nez Perce Rt. I-15					
Butte or S.- Helena N.	US 91	197	478	90	765
Dillon-Helena	Mont. 41	36	18	5	59
Dillon-Boulder	Mont. 41	0	3	0	3
Anaconda-Helena	U.S. 12	5	36	1	42
Total		238	535	96	869
Basin Rt. Remaining US 91					
Butte-Basin		10	51	4	65
Butte-Boulder or N.		22	25	79	126
Butte-Local North		4	101	2	107
Total		36	177	85	298
Boulder River Valley Remaining FAS 281					
Boulder Valley Local		12	128	17	157
Boulder Valley Thru		57	205	42	304
Total		69	333	59	461
Whitehall-Boulder FAS 399 Remaining					
Whitetail Thru		5	19	4	28
Whitetail Local		6	70	8	84
Total		11	89	12	112

LEGEND

FPC = Foreign Passenger Cars
LPC = Local Passenger Cars
TR = Trucks

1970 TRIP TABLE.

Whitetail Rt. Alt. # 3

Trip	Diverted From	FPC	LPC	TR	TOT
Whitetail I-15					
Boulder-Whitehall or S.		50	174	36	260
Whitetail-Local		6	70	8	84
Butte or W.-Boulder or N.	U.S. 91	125	346	28	499
Helena-Anaconda	U.S. 12	5	22	1	28
Boulder Valley-East	FAS 281	43	33	4	80
Three Forks-Helena	U.S. 12	60	40	1	101
Dillon-Helena	U.S. 91	80	11	7	98
Total		369	696	85	1150
Basin Rt. remaining U.S. 91					
Butte-Basin		10	51	4	65
Butte or W.-Boulder or N.		14	142	130	286
Butte-Local North		4	101	2	107
Dillon-Helena		0	4	4	8
Total		28	298	140	466
Boulder River Valley Rt. remaining FAS 281					
Boulder Valley thru		5	38	11	54
Boulder Valley Local		12	128	17	157
Total		17	166	28	211

Boulder River Valley Rt. Alt. # 4

Trip	Diverted From	FPC	LPC	TR	TOT
Boulder Valley I-15					
Butte-Bozeman		0	0	2	2
Butte-Pony		0	2	0	2
Boulder-Ennis		0	5	0	5
Boulder-Bozeman		3	22	3	28
Helena-Three Forks		2	10	0	12
Helena-Bozeman		9	16	3	28
Helena-Yellowstone		33	9	7	49
Helena-Ennis		1	5	0	6
Helena-Whitehall		1	26	4	31
Helena-Dillon		39	40	19	98
Helena-Twin Bridges		4	32	4	40
Boulder-Whitehall		2	46	4	52
Boulder-Twin Bridges		0	11	3	14
Boulder-Dillon		0	8	0	8
Basin-Whitehall		1	0	0	1
Butte-Boulder		1	8	2	11
Butte-Whitehall		2	3	0	5
Boulder Valley-Local		12	128	17	157
Butte or W.-Boulder or N.	U.S. 91	125	195	13	333
Anaconda-Helena	U.S. 12	5	14	0	19
Three Forks-Helena	U.S. 12	103	67	3	173
Dillon-Helena	U. S. 91	80	11	8	99
Boulder-Three Forks		0	2	0	2
Total		423	660	92	1175
Basin Rt. remaining U.S. 91					
Butte or W.-Boulder or N.		14	293	145	452
Butte-Basin		10	51	4	65
Butte-Local North		4	101	2	107
Dillon-Helena		0	4	3	7
Total		28	449	154	631
Whitehall-Boulder FAS 399					
Whitetail		6	70	8	84

LEGEND

FPC = Foreign Passenger Cars
LPC = Local Passenger Cars
TR = Trucks

TABLE 3

1987 Expansion Trip Table Interstate Traffic

1987 Expansion Factor-1.79

Trip	Diverted From	Expanded Traffic F.P.C.	Expanded Traffic L.P.C.	Expanded Traffic Tr.	Expanded Traffic Total
Basin Route I-15					
Dillon-Helena		143	27	20	190
Helena-Butte		188	591	241	1020
Anaconda-Helena		16	25	23	64
Butte-Boulder		41	234	13	288
Butte-Basin		18	91	7	116
Butte-Jefferson City		2	18	12	32
Butte-Local North		7	181	4	192
Dillon-Boulder	Mont. 41	0	5	0	5
Dillon-Helena	Mont. 41	65	27	11	103
Anaconda-Helena	U.S. 12	9	57	4	70
Total		489	1256	335	2080
Nez Perce Rt. I-15					
Butte or S.-Helena or N.	U.S. 91	[illegible]	856	161	1370
Dillon-Helena	Mont. 41	65	32	9	106
Dillon-Boulder	Mont. 41	0	5	0	5
Anaconda-Helena	U.S. 12	8	65	2	75
Total		426	958	172	1556
Whitetail Rt. I-15					
Boulder-Whitehall or S.		90	312	64	466
Whitetail-Local		11	125	14	150
Butte or W.-Boulder or N.	U.S. 91	224	619	50	893
Helena-Anaconda	U.S. 12	9	39	2	50
Boulder Valley-East	FAS 281	77	59	7	143
Three Forks-Helena	U.S. 12	107	72	2	181
Dillon-Helena	U.S. 91	143	20	13	176
Total		661	1246	152	2059

Trip	Diverted From	Expanded Traffic F.P.C.	Expanded Traffic L.P.C.	Expanded Traffic Tr.	Expanded Traffic Total
Boulder River Valley Rt. I-15					
Butte-Bozeman		0	0	4	4
Butte-Pony		0	4	0	4
Boulder-Ennis		0	9	0	9
Boulder-Bozeman		5	39	6	50
Helena-Three Forks		4	18	0	22
Helena-Bozeman		16	29	5	50
Helena-Yellowstone		59	16	13	87
Helena-Ennis		2	9	0	11
Helena-Whitehall		2	47	7	56
Helena-Dillon		70	72	34	176
Helena-Twin Bridges		7	57	7	71
Boulder-Whitehall		3	83	7	93
Boulder-Dillon		0	14	0	14
Boulder Twin Bridges		0	20	5	25
Basin-Whitehall		2	0	0	2
Butte-Boulder		2	14	4	20
Butte-Whitehall		4	5	0	9
Boulder Valley-Local		21	229	30	280
Butte or W.-Boulder or N.	U.S. 91	224	349	23	596
Anaconda-Helena	U.S. 12	9	25	0	34
Three Forks-Helena	U.S. 12	184	120	5	309
Dillon-Helena	U.S. 91	143	20	14	177
Boulder-Three Forks		0	4	0	4
Total		757	1181	165	2103

LEGEND

FPC = Foreign Passenger Cars
LPC = Local Passenger Cars
TR = Trucks

TABLE 4

1997 Expanded Trip Table Interstate Traffic

1997 Expansion Factor-2.08

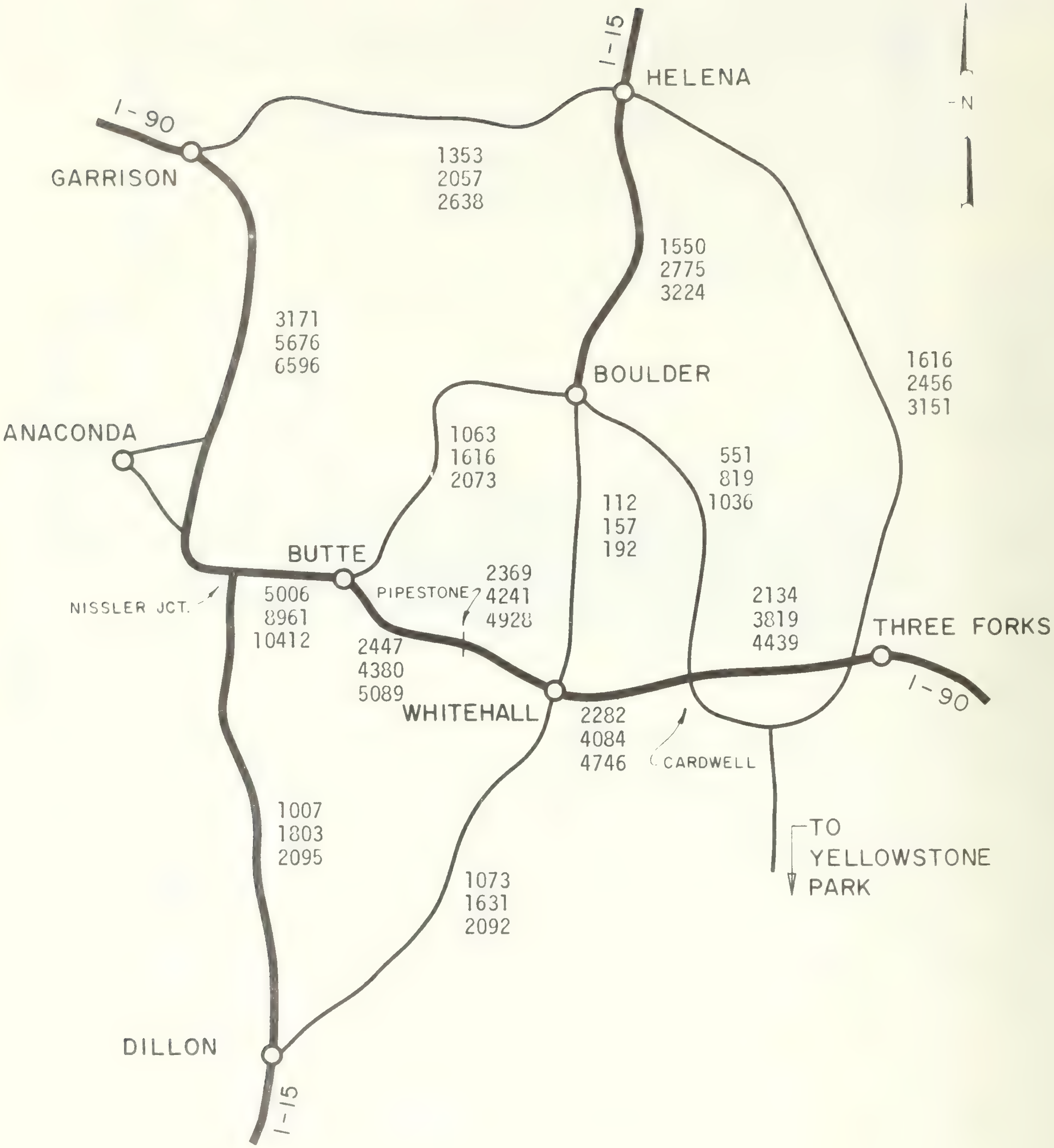
		Expanded			Traffic
	Diverted From	F.P.C.	L.P.C.	Tr.	Total
Basin Route I-15					
Dillon-Helena		167	31	23	221
Helena-Butte		218	686	281	1185
Anaconda-Helena		19	29	27	75
Butte-Boulder		48	273	15	336
Butte-Basin		21	106	8	135
Butte-Jefferson City		2	21	14	37
Butte-Local North		8	210	4	222
Dillon-Boulder	Mont. 41	0	6	0	6
Dillon-Helena	Mont. 41	75	31	13	119
Anaconda-Helena	U.S. 12	10	67	4	81
Total		568	1460	389	2417
Nez Perce Rt. I-15					
Butte or S.-Helena or N.	U.S. 91	410	994	187	1591
Dillon-Helena	Mont. 41	75	38	10	123
Dillon-Boulder	Mont. 41	0	6	0	6
Anaconda-Helena	U.S. 12	10	75	2	87
Total		495	1113	199	1807
Whitetail I-15					
Boulder-Whitehall or S.		104	362	75	541
Whitetail-Local		13	145	17	175
Butte or W.-Boulder or N.	U.S. 91	260	719	58	1037
Helena-Anaconda	U.S. 12	10	46	2	58
Boulder Valley-East	F.A.S. 281	89	69	8	166
Three Forks-Helena	U.S. 12	125	84	2	201
Dillon-Helena	U.S. 91	166	23	15	204
Total		767	1448	177	2392

				Expanded Traffic	
Trip	Diverted From	F.P.C.	L.P.C.	Tr.	Total
Boulder River Valley Rt. I-15					
Butte-Bozeman		0	0	5	5
Butte-Pony		0	4	0	4
Boulder-Ennis		0	10	0	10
Boulder-Bozeman		6	46	6	58
Helena-Three Forks		4	21	0	25
Helena-Bozeman		19	33	6	58
Helena-Yellowstone		69	19	15	103
Helena-Ennis		2	10	0	12
Helena-Whitehall		2	54	8	64
Helena-Dillon		81	83	40	204
Helena-Twin Bridges		8	67	8	83
Boulder-Whitehall		4	96	8	108
Boulder-Twin Bridges		0	23	6	29
Boulder-Dillon		0	17	0	17
Basin-Whitehall		2	0	0	2
Butte-Boulder		2	17	5	24
Butte-Whitehall		4	6	0	10
Boulder Valley-Local		25	266	35	326
Butte or W.-Boulder or N.	U.S. 91	260	406	27	693
Anaconda-Helena	U.S. 12	11	29	0	40
Three Forks-Helena	U.S. 12	214	139	6	359
Dillon-Helena	U.S. 91	167	23	16	206
Boulder-Three Forks		0	4	0	4
Total		880	1373	191	2444

LEGEND

FPC = Foreign Passenger Cars
LPC = Local Passenger Cars
TR = Trucks

TABLE 5



LEGEND

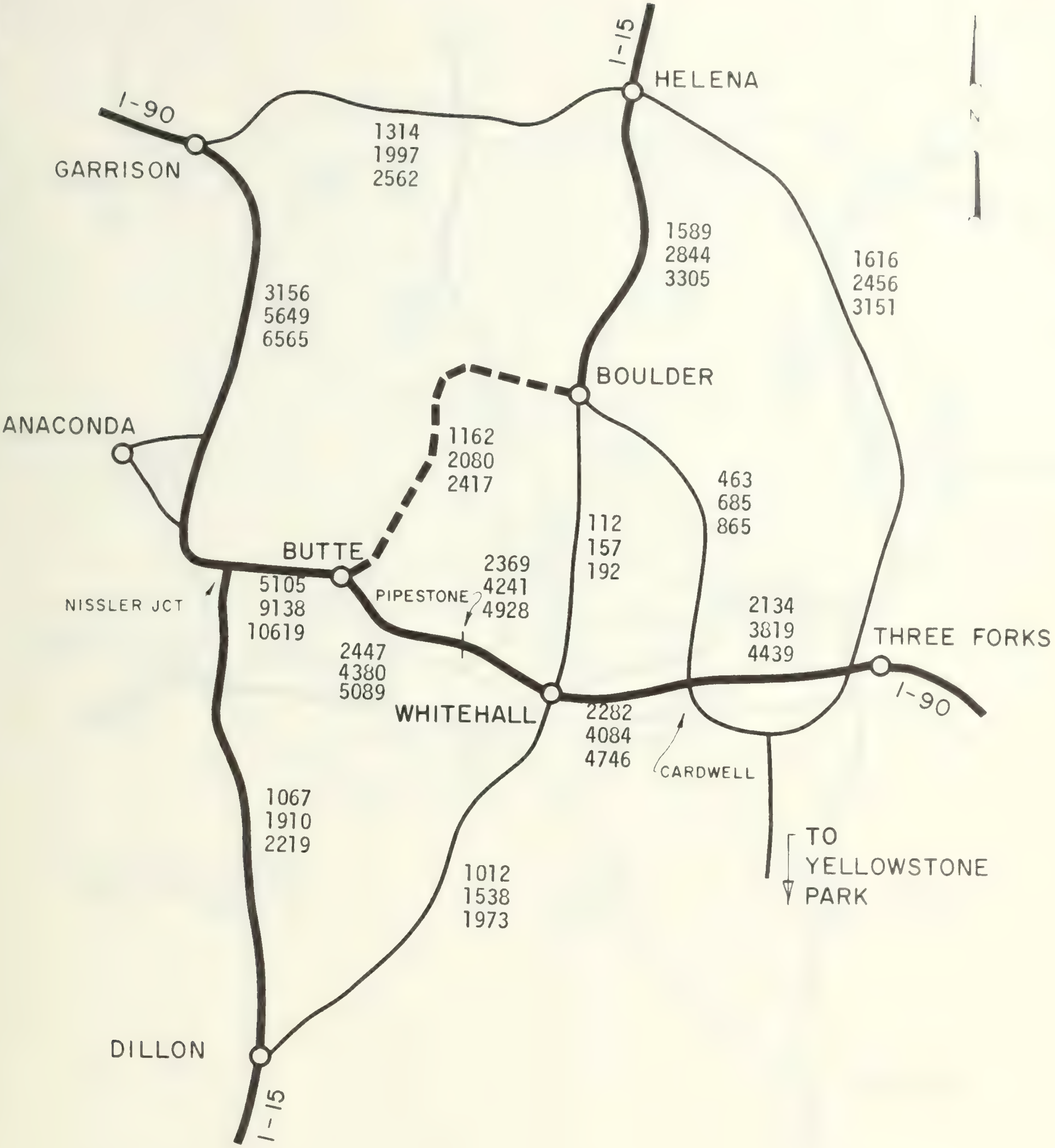
Figure	Year	No. of Vehicles
TOP	- 1970 ADT	00
MID.	- 1987 ADT	00
BOT.	- 1997 ADT	00

ADT = Average Daily Traffic

TRAFFIC ASSIGNMENT

EXISTING CONDITION

FIGURE 8



LEGEND

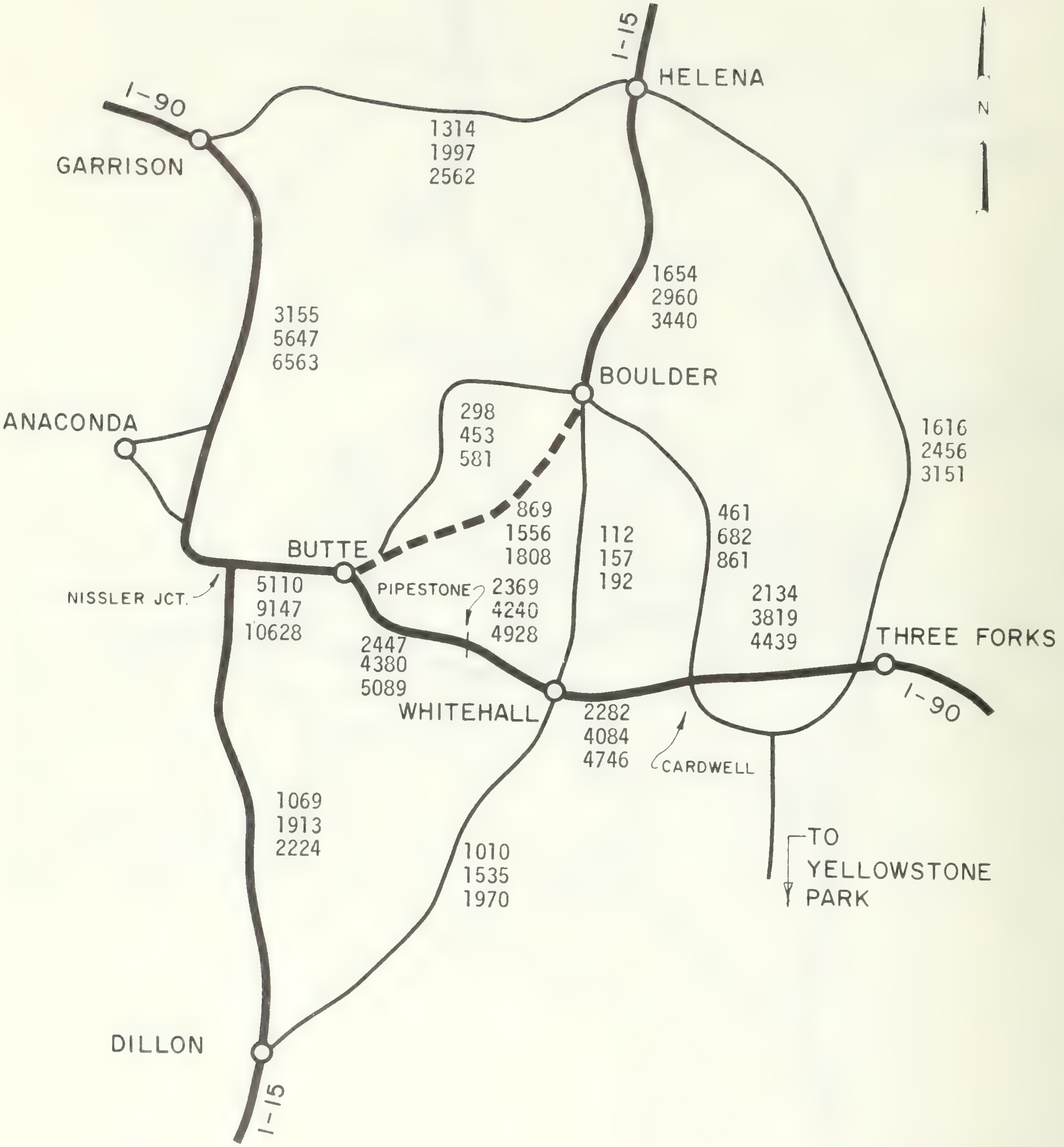
Figure	Year	No. of Vehicles
TOP	- 1970 ADT	00
MID.	- 1987 ADT	00
BOT.	- 1997 ADT	00

ADT = Average Daily Traffic

TRAFFIC ASSIGNMENT

BASIN ROUTE

FIGURE 9



LEGEND

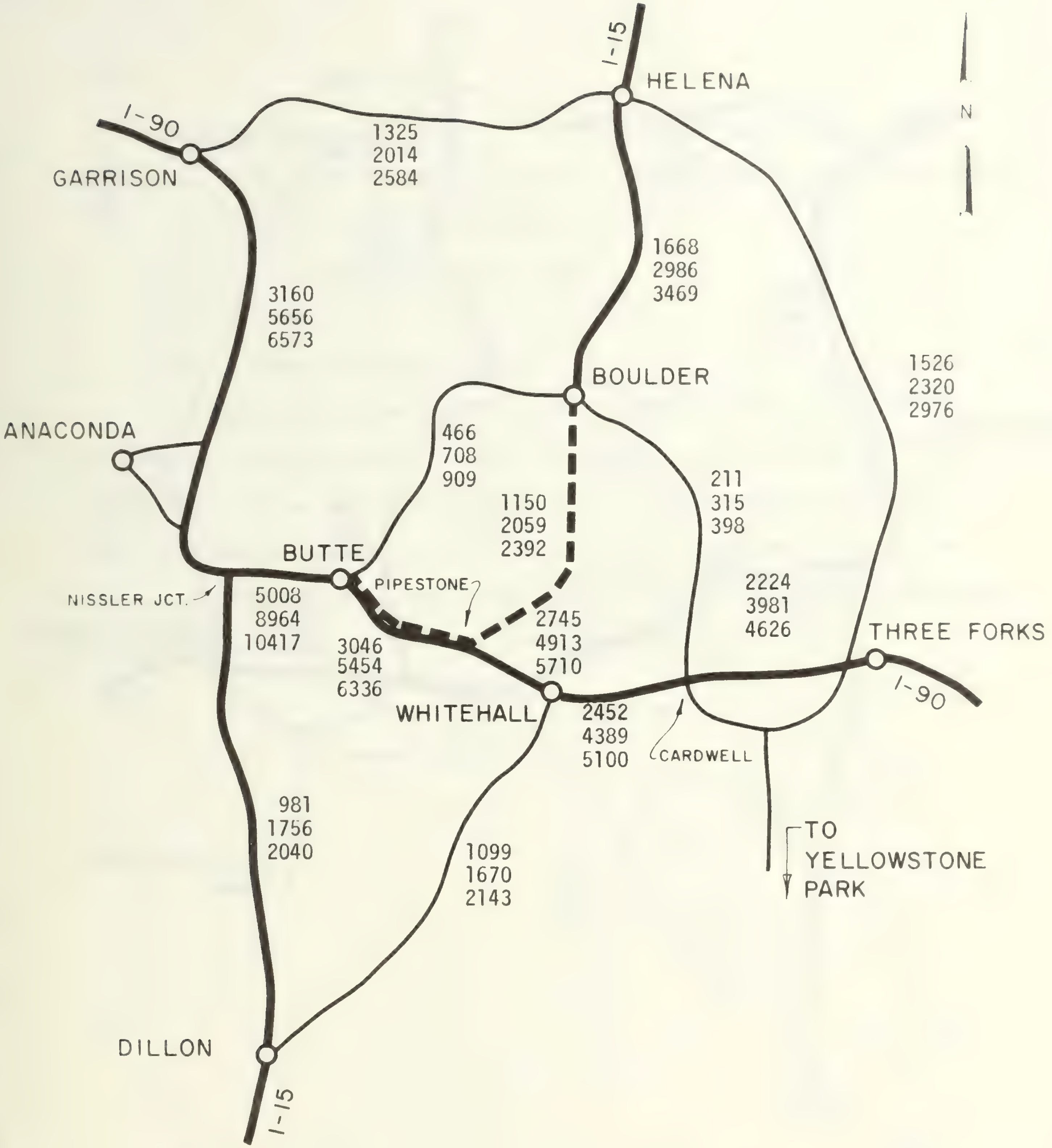
Figure	Year	No. of Vehicles
TOP	- 1970 ADT	00
MID.	- 1987 ADT	00
BOT.	- 1997 ADT	00

ADT = Average Daily Traffic

TRAFFIC ASSIGNMENT

NEZ PERCE ROUTE

FIGURE 10



LEGEND

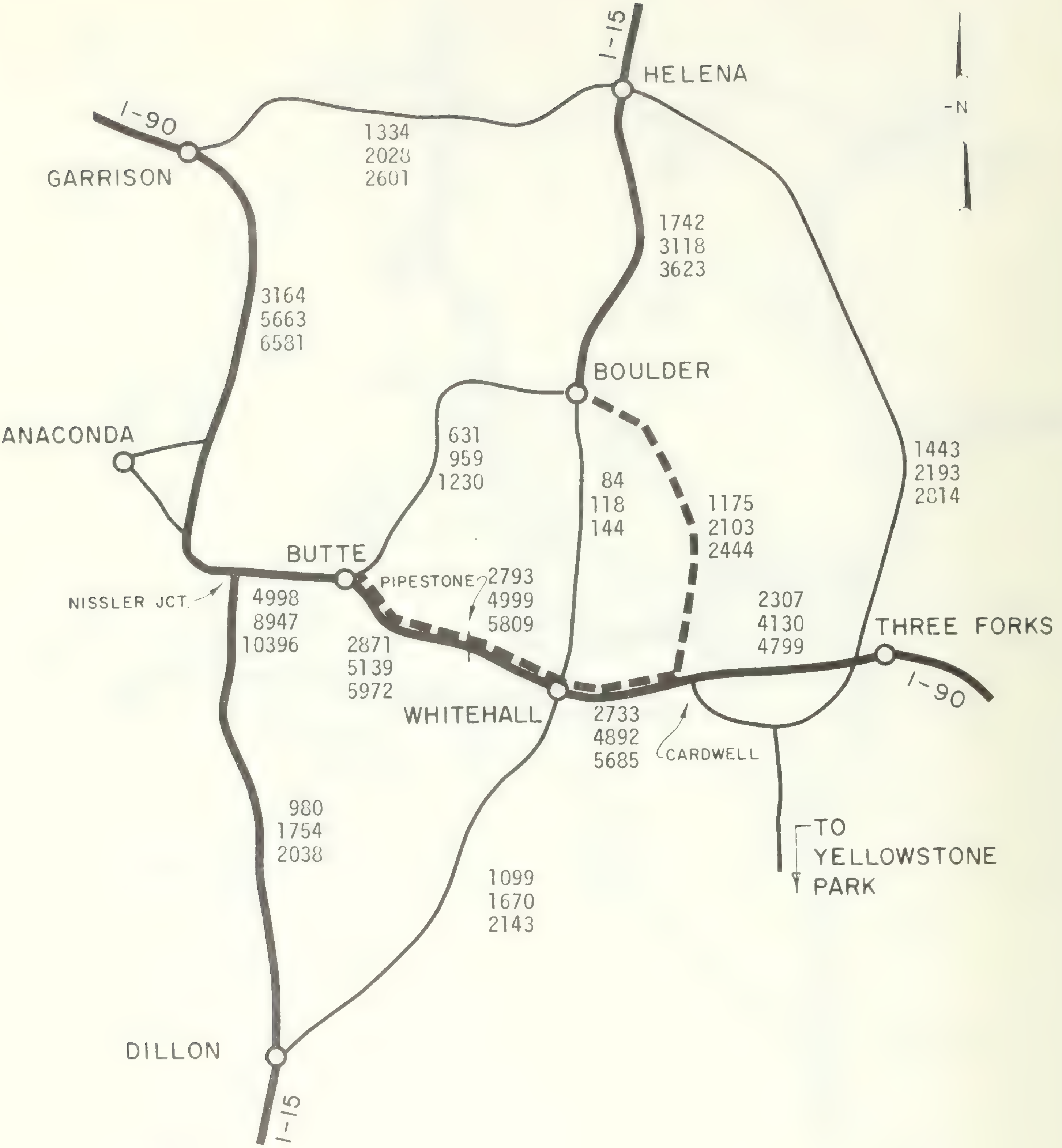
Figure	Year	No. of Vehicles
TOP	- 1970 ADT	00
MID.	- 1987 ADT	00
BOT.	- 1997 ADT	00

ADT = Average Daily Traffic

TRAFFIC ASSIGNMENT

WHITETAIL ROUTE

FIGURE 11



LEGEND

Figure	Year	No. of Vehicles
TOP	- 1970 ADT	00
MID.	- 1987 ADT	00
BOT.	- 1997 ADT	00

ADT - Average Daily Traffic

TRAFFIC ASSIGNMENT

BOULDER VALLEY ROUTE

FIGURE 12

Road User Operating Costs - were then developed for autos and pick-ups and for trucks. The following items are included in these costs:

(1) Fuel, oil and tire consumption.

(2) Cost per hour for driver's time.

(3) Accident costs.

(4) Depreciation of the vehicle.

Average running speeds were developed based on as-built plans for the existing roads and based on design speeds, gradient and curvature expected to be used on newly constructed routes. Table 7 shows vehicle operating costs for the various vehicles and for various roadways. The cost per mile shown in the table has been rounded to the nearest cent. The cost per trip was calculated using the actual computed cost per mile.

VEHICLE OPERATING COSTS

Route Name		Autos & Pickups		Trucks	
	Miles	¢/Mile	$/Trip	¢/Mile	$/Trip
BASIN					
Boulder-Butte I-15	36	15	5.40	40	14.40
Total Trip	36		5.40		14.40
NEZ PERCE					
Boulder-Butte I-15	29	15	4.35	50	14.50
Total Trip	29		4.35		14.50
WHITETAIL					
Boulder-Pipestone I-15	26	15	3.90	45	11.70
Pipestone-Butte I-90	18	15	2.70	50	9.00
Total Trip	44		6.60		20.70
BOULDER VALLEY					
Boulder-Cardwell I-15	31	15	4.65	40	12.40
Cardwell-Pipestone I-90	10	15	1.50	40	4.00
Pipestone-Butte I-90	18	15	2.70	50	9.00
Total Trip	59		8.85		25.40
BASIN EXISTING					
Boulder-Butte U.S. 91	37	17	6.29	45	16.65
Total Trip	37		6.29		16.65
WHITETAIL EXISTING					
Boulder-Whitehall FAS 399	26	17	4.42	47	12.22
Whitehall-Pipestone I-90	5	15	.75	40	2.00
Pipestone-Butte I-90	18	15	2.70	50	9.00
Total Trip	49		7.87		23.22
BOULDER VALLEY EXISTING					
Boulder-Cardwell FAS 281	33	17	5.61	45	14.85
Cardwell-Pipestone I-90	10	15	1.50	40	4.00
Pipestone-Butte I-90	18	15	2.70	50	9.00
Total	61		9.81		27.85

TABLE 7

Construction Cost Estimates - were developed for each of the four alternate Interstate routes, as well as for anticipated improvements to existing routes which were associated with the corresponding four Interstate routes. Not all improvements to existing routes are necessary due to Interstate construction only. However, it is necessary to include these costs here because the extent of improvement is dependent upon which Interstate alternate is selected. The extent of improvements to existing routes is based on estimated traffic volumes expected to be using these routes in the design year 1997. The length limits of improvements for FAS 281 and FAS 399 would be Boulder and I-90. U.S. 91 improvements limits would be Boulder and Elk Park Pass. Costs for portions of Interstate 15 which are already constructed between the Beginning and Ending Common Points were provided by the Montana Department of Highways. All estimated construction and improvement costs are shown in Table 8.

According to conventional practice, right-of-way and engineering costs are included in the construction cost estimates.

The cost of the completed sections of I-15 near Boulder and Butte are included in the figures given in Table 8. The roadway section under each alternate which is labeled "Interstate-15" includes the cost of completed sections of I-15 which are to be used as part of the alternate route being considered. The roadway section labeled "Existing Interstate-15" shows the cost of those sections of I-15 which are already constructed but which will not be used as Interstate with the alternate I-15 route being considered.

ESTIMATED CAPITAL CONSTRUCTION COSTS

	SECTIONS	RIGHT-OF-WAY	MAJOR STRUCTURES	GRADING & DRAINAGE	PAVEMENT & SIGNING	DESIGN & CONSTRUCTION ENGINEERING	TOTAL
BASIN ROUTE	Interstate - 15*	$1,700,000	$3,629,900	$16,895,300	$7,478,700	$2,117,000	$31,820,900
	Upgrade FAS 399	-	-	563,440	718,280	64,080	1,345,800
	Upgrade FAS 281	-	312,000	1,296,000	672,000	120,000	2,400,000
	TOTAL	1,700,000	3,941,900	18,754,740	8,868,980	2,301,080	$35,566,700
NEZ PERCE ROUTE	Interstate - 15*	928,000	677,000	22,642,300	6,688,100	1,723,000	32,658,400
	Upgrade U.S. 91	-	733,080	2,778,830	2,074,370	279,320	5,865,600
	Upgrade FAS 399	-	-	563,440	718,280	64,080	1,345,800
	Upgrade FAS 281	-	312,000	1,296,000	672,000	120,000	2,400,000
	Existing Interstate-15 at Boulder **	19,680	88,860	523,170	286,260	69,030	987,000
	TOTAL	947,680	1,810,940	27,803,740	10,439,010	2,255,430	$43,256,800
WHITETAIL ROUTE	Interstate - 15*	600,000	1,354,000	9,774,100	5,438,000	1,190,000	18,356,100
	Upgrade U.S. 91	-	813,230	3,546,300	2,488,460	342,410	7,190,400
	Upgrade FAS 281	-	312,000	1,296,000	672,000	120,000	2,400,000
	Existing Interstate-15 at Boulder**	19,680	88,860	523,170	286,260	69,030	987,000
	Existing Interstate-15 at Butte**	54,540	245,580	1,446,050	791,280	191,050	2,728,500
	TOTAL	674,220	2,813,670	16,585,620	9,676,000	1,912,490	$31,662,000
BOULDER VALLEY ROUTE	Interstate-15*	675,000	1,257,300	6,339,000	6,098,300	1,095,600	15,465,200
	Upgrade U.S. 91	-	813,230	3,546,300	2,488,460	342,410	7,190,400
	Upgrade FAS 399	-	-	563,440	718,280	64,080	1,345,800
	Existing Interstate-15 at Boulder**	35,190	158,480	933,600	510,780	123,450	1,761,500
	Existing Interstate-15 at Butte**	54,540	245,580	1,446,050	791,280	191,050	2,728,500
	TOTAL	764,730	2,474,590	12,828,390	10,607,100	1,816,590	$28,491,400

*Includes cost of uncompleted sections of I-15 [illegible]

TABLE [illegible]

**Cost of completion sections of I-15 not [illegible]

Table 9 is a further breakdown of the roadway sections labeled "Interstate-15" in Table 8. It shows the costs of the completed portions of I-15 only which will be used as part of the Interstate route with each alternate being considered.

Figure 13 is included to show the average travel times on each link of the road network. It also shows the lengths of each link and the average running speed of cars and trucks.

ESTIMATED CONSTRUCTION COSTS OF COMPLETED SECTIONS OF I-15	
BASIN ROUTE	
Butte North	$2,728,500
Boulder Hill South	1,761,500
Total	$4,490,000
NEZ PERCE ROUTE	
Butte North	$2,728,500
Boulder Hill South	774,500
Total	$3,503,000
WHITETAIL ROUTE	
Boulder Hill South	$ 774,500
Total	$ 774,500
BOULDER VALLEY ROUTE	
Total	None

TABLE 9

Maintenance Costs - were also provided by the Montana Department of Highways, Maintenance Division, and they include costs on Interstate and primary and secondary routes which would change depending on which alternate Interstate route is selected. Maintenance costs on I-90 are not included because it is presently being maintained and the costs would remain the same for all alternates. These costs are shown in Table 10.

ESTIMATED ANNUAL MAINTENANCE COSTS	
ALTERNATE ROUTES	COST
Alt. 1: Basin Route	$140,531
Alt. 2: Nez Perce	220,288
Alt. 3: Whitetail	177,566
Alt. 4: Boulder Valley	160,425

TABLE 10

Economic Road User Analysis - used in this report is the equivalent uniform annual cost method in which all invested monies are converted to an annual cost amount based on a 6% interest rate and based on the estimated service life of the cost components as shown in Table 11.

SERVICE LIFE OF HIGHWAY COMPONENTS	
COMPONENT	ESTIMATED SERVICE LIFE IN YEARS
Right-of-Way	60
Major Structures	50
Pavement & Signs	20
Grading & Drainage	40
Design & Construction Engineering	20

TABLE 11

The annualized construction costs for each alternate transportation network are shown on Table 12.

ESTIMATED ANNUAL CONSTRUCTION COSTS

SECTIONS		RIGHT-OF-WAY	MAJOR STRUCTURES	GRADING & DRAINAGE	PAVEMENT & SIGNING	DESIGN & CONSTRUCTION ENGINEERING	TOTAL
BASIN ROUTE	Interstate-15	$105,230	$230,136	$1,123,537	$652,143	$184,602	$2,295,648
	Upgrade FAS 399	-	-	37,469	62,634	5,588	105,691
	Upgrade FAS 281	-	19,781	86,184	58,598	10,464	175,027
	TOTAL	105,230	249,917	1,247,190	773,375	200,654	2,576,366
NEZ PERCE ROUTE	Interstate-15	57,443	42,922	1,505,712	583,202	150,246	2,339,525
	Upgrade U.S. 91	-	46,477	184,792	180,885	24,357	436,511
	Upgrade FAS 399	-	-	37,469	62,634	5,588	105,691
	Upgrade FAS 281	-	19,781	86,184	58,598	10,464	175,027
	Existing Interstate-15 at Boulder	1,218	5,634	34,791	24,962	6,019	72,624
	TOTAL	58,661	114,814	1,848,948	910,281	196,674	3,129,378
WHITETAIL ROUTE	Interstate-15	37,140	85,844	649,978	474,194	103,768	1,350,924
	Upgrade U.S. 91	-	53,387	244,193	224,689	30,917	553,186
	Upgrade FAS 281	-	19,781	86,184	58,598	10,464	175,027
	Existing Interstate-15 at Boulder	1,218	5,634	34,791	24,962	6,019	72,624
	Existing Interstate-15 at Butte	3,376	15,570	96,162	69,000	16,660	200,768
	TOTAL	41,734	180,216	1,111,308	851,443	167,828	2,352,529
BOULDER VALLEY ROUTE	Interstate-15	41,782	79,713	421,544	531,772	95,536	1,170,347
	Upgrade U.S. 91	-	51,559	235,829	216,994	29,858	534,240
	Upgrade FAS 399	-	-	37,469	62,634	5,588	105,691
	Existing Interstate-15 at Boulder	2,178	10,047	62,084	44,540	10,765	129,614
	Existing Interstate-15 at Butte	3,376	15,570	96,162	69,000	16,660	200,768
	TOTAL	47,336	156,889	853,088	924,940	158,407	2,140,660

TABLE 12

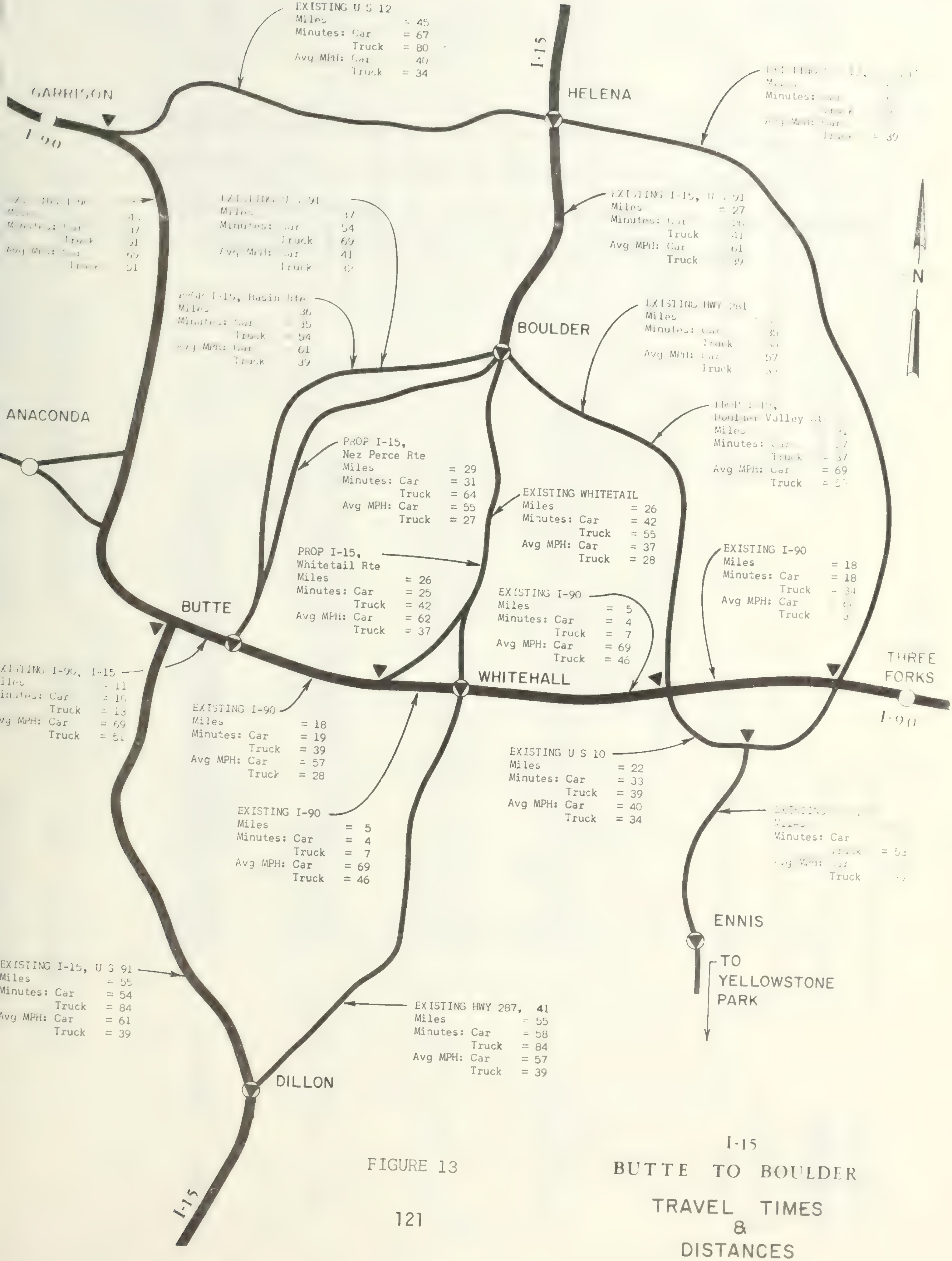


FIGURE 13

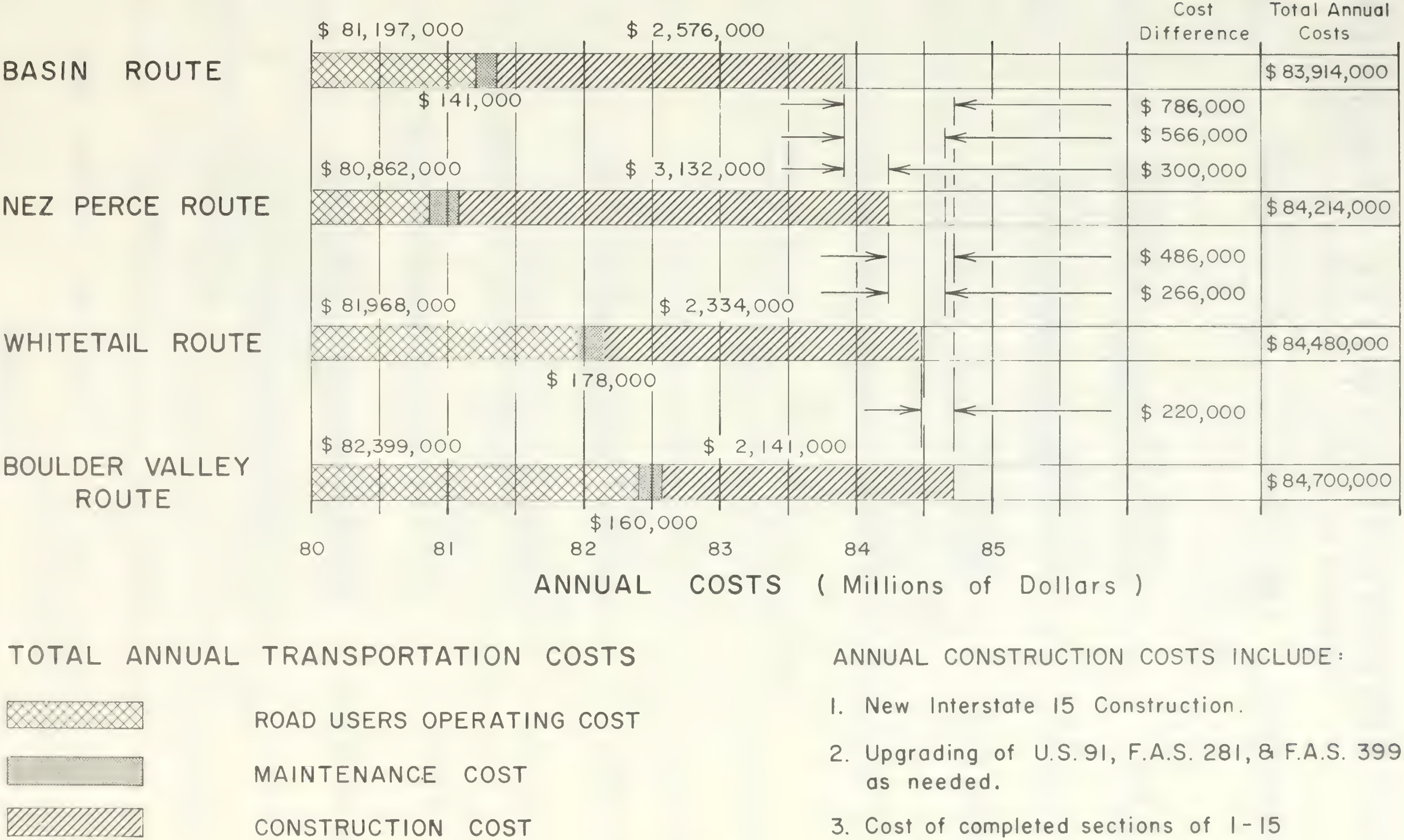
I-15
BUTTE TO BOULDER
TRAVEL TIMES
&
DISTANCES

Annual road user operating costs were computed based on estimated volumes at the mid-year 1987 and based on route length and on vehicle costs per mile as shown on Figures 14, 15 & 16 for the various combinations of study used. These are explained later in this section of the report.

INTERSTATE 15 - BUTTE TO BOULDER

SUMMARY OF ANNUAL TRANSPORTATION COSTS

(REGIONAL ANALYSIS)



ANNUAL CONSTRUCTION COSTS INCLUDE:

1. New Interstate 15 Construction.
2. Upgrading of U.S. 91, F.A.S. 281, & F.A.S. 399 as needed.
3. Cost of completed sections of I-15

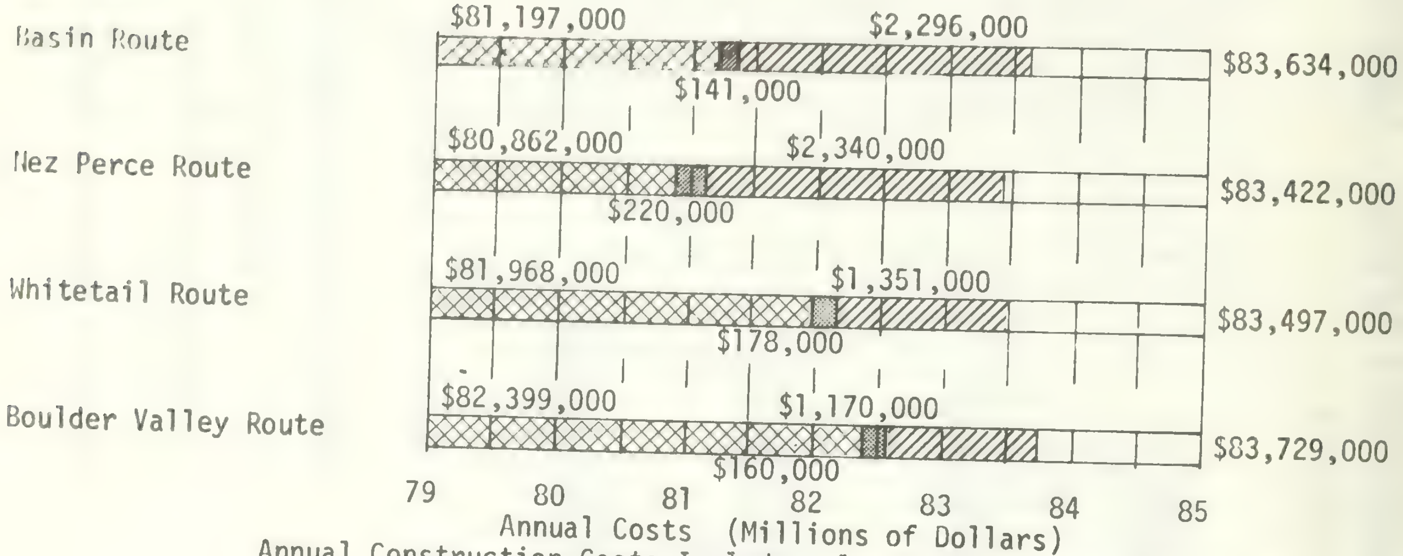
FIGURE 14

INTERSTATE 15 - BUTTE TO BOULDER

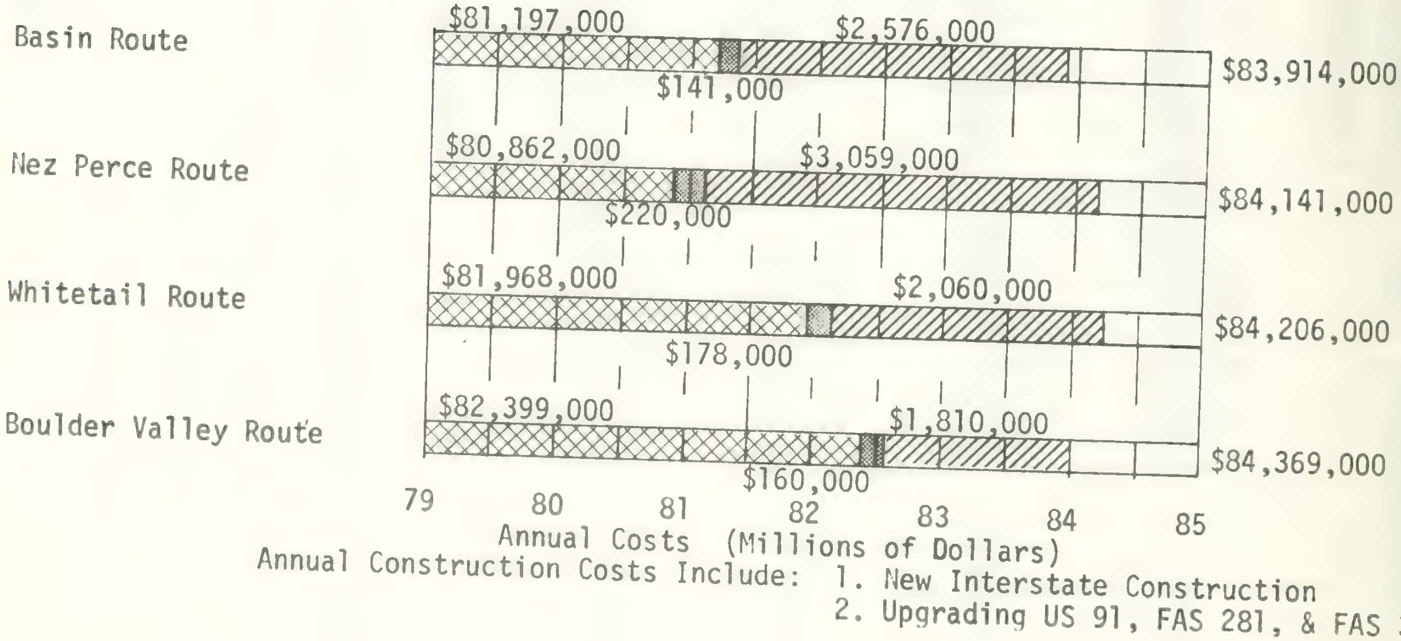
SUMMARY OF ANNUAL TRANSPORTATION COSTS

(REGIONAL ANALYSIS)

▨ Road Users Operating Cost + ▩ Maintenance Cost + ▨ Construction Cost = Total Annual Cost



Annual Construction Costs Include: 1. New Interstate Construction



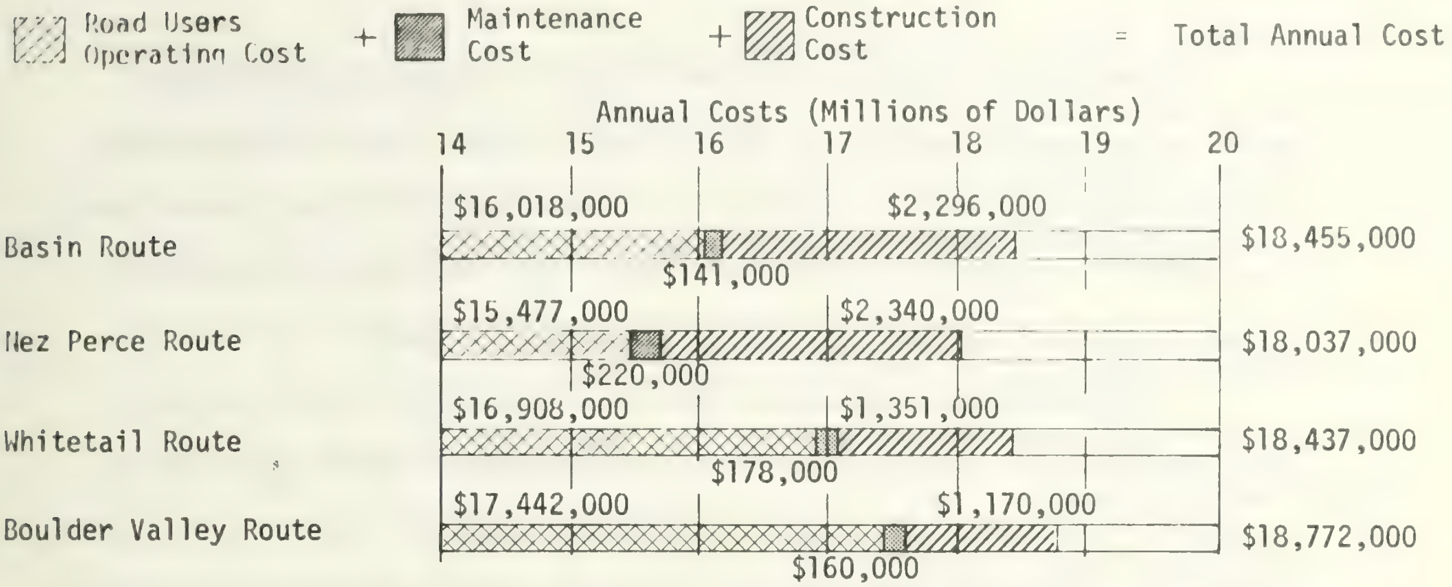
Annual Construction Costs Include: 1. New Interstate Construction
2. Upgrading US 91, FAS 281, & FAS 399

FIGURE 15

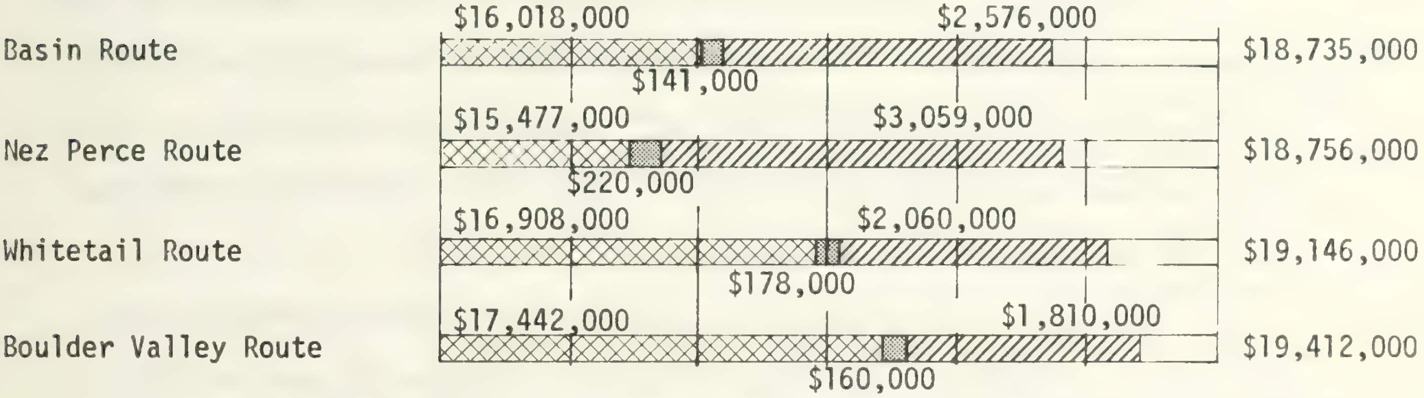
INTERSTATE 15 - BUTTE TO BOULDER

SUMMARY OF ANNUAL TRANSPORTATION COSTS

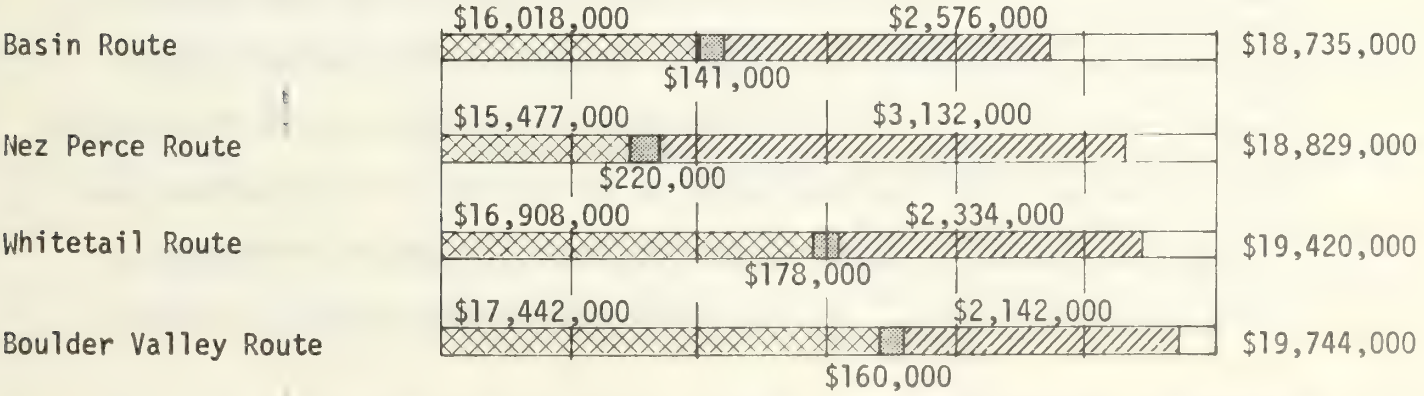
(Small Area Analysis)



Annual Construction Costs Include: 1. New Interstate Construction



Annual Construction Costs Include: 1. New Interstate Construction
2. Upgrading US 91, FAS 281 & FAS 399



Annual Construction Costs Include: 1. New Interstate Construction
2. Upgrading US 91, FAS 281 & FAS 399
3. Cost of Completed Sections of I-15

FIGURE 16

This type of analysis provides a method of comparative economics which can be used to select the most desirable route. No attempt was made to economically justify any route since an Interstate 15 route between Butte and Boulder is justified by the fact that it is a required link in the continuous system of National Interstate and Defense Highways.

The annual road user costs shown on Figures 14, 15 & 16 are high when compared with annual construction and maintenance costs. This is because road user operating costs for the entire regional road network as shown on Figure 7 (over 400 miles of road) were used whereas construction and maintenance costs for only the small study area had to be used.

The Analysis. Equivalent uniform annual costs were computed for each alternate route network. The costs included were maintenance, construction, and road user operating costs. The total systems approach was used in which all alternate routes and costs related to them within the Area of Influence as shown on Figure 7 were considered.

Included in the construction cost estimates for each alternate are the section of two-lane Interstate 15 between Butte and Elk Park Pass (referred to as Butte North) and that portion of four-lane I-15 extending southwest from the End Common Point near Boulder which are already constructed. The Butte North section can be fully used with the Basin and the Nez Perce alternates and the section near Boulder can be used with the Basin Route. However, only a portion of the section near Boulder can be used if the Whitetail or the Nez Perce alternate is selected, and none of the presently constructed Interstate at either end can be used as Interstate if the Boulder Valley Route is selected. The completed sections can be used as a portion of the primary route if any alternate except the Basin Route is selected. These costs were included in all alternates according to the length of section to be used because in this type analysis all public monies which are or have been expended on the project must be considered in order to fairly evaluate the relative merits of each route.

Other factors which influenced the results of the analysis were the effect of Interstate construction on other primary and secondary roads in the study area. These factors were considered in the traffic assignment process and in estimating the construction, maintenance and road user costs. The economic impact on communities is not a part of this Section II "Highway Economics" analysis; but is covered in this report in the Socio-Economic Study, Section V.

Several variations in the analytic approach to the problem were completed. The results of these analyses are illustrated in Figures 14, 15 & 16. Figures 14 and 15 are based on a regional analysis which considers the total Area of Influence as shown on Figure 7. Figure 16 is based on a reduced study area which is indicated as the Small Area analysis boundary on Figure 7. When studying each of the areas, three different approaches were used. In the first, only new Interstate construction was considered. In the second, new Interstate construction plus upgrading of related primary and secondary routes and the cost of completed sections of Interstate 15 were included for each of the alternates being considered. The relative results of any of the six bar charts are not markedly different, which indicates that a recommendation which might be made based on these studies would not change under any of the studied situations. It is felt, however, that the bar chart shown on Figure 14 is the one which should be used as the basis for decision making since it includes all costs related to the construction of the Interstate route.

The Results. Figure 14, which shows the total of the annual road user operating costs, annual maintenance costs and annual construction costs, shows that alternate 1, the Basin Route, is economically the most desirable. The Nez Perce Route provides lower road user operating costs and the Whitetail and Boulder Valley Routes show lower annual construction costs, but when considering the total annual expenditure of public funds, the Basin route would be the most beneficial.

The general results of the analysis of Highway Economics can be expressed as a relative degree of economic impact and this is shown on the following graphic impact evaluation chart.

IMPACT EVALUATION

	BASIN	NEZ PERCE	WHITETAIL	BOULDER VALLEY
HIGHWAY ECONOMICS	○	◍	◍	●

HIGH IMPACT ●
MEDIUM IMPACT ◍
LOW IMPACT ○

REFERENCES

HIGHWAY ECONOMIC REFERENCES

1. NCHRP Report 111; National Highway Research Board.

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SECTION III

ENGINEERING and the ENVIRONMENT

MORRISON-MAIERLE, INC.
Consulting Engineers Helena, Montana

Page

SECTION III - ENGINEERING AND THE ENVIRONMENT

- INTRODUCTION ---------- 133
- GEOLOGY ---------- 134
  - Engineering Geology ---------- 135
  - Seismic Considerations ---------- 138
    - Map of Seismic Probability ---------- 140
    - Geology Map ---------- 142 & 143
- HYDROLOGY AND STREAM CHANNEL STUDIES ---------- 145
  - Basin Route ---------- 145
  - Nez Perce Route ---------- 147
  - Whitetail Route ---------- 147
  - Boulder Valley Route ---------- 148
- AIR POLLUTION ---------- 149
  - Auto Emissions ---------- 149
    - Table 13 - Vehicle Exhaust Emissions ---------- 150
    - Figure 17 - Vehicle Exhaust Emissions ---------- 151
  - Other Air Contaminants ---------- 152
- NOISE LEVELS ---------- 154
  - Table 14 - Predicted Noise Levels ---------- 156
  - Table 15 - Design Noise Levels ---------- 157
  - Table 16 - Noise Standards ---------- 158
  - Table 17 - Measured Noise Levels ---------- 158
- WATER QUALITY ---------- 159
  - Basin Route ---------- 159
  - Nez Perce Route ---------- 160
  - Whitetail Route ---------- 160
  - Boulder Valley Route ---------- 160
- CLIMATE ---------- 162
  - Climate Map ---------- 164 & 165
- SUMMARY OF RATINGS ---------- 167
  - Impact Evaluation Chart ---------- 168
- APPENDIX TO SECTION III ---------- 169
  - Fish Population Study - Boulder River & Bison Creek (Mont. Fish & Game) ---------- 171 to 176
- REFERENCES ---------- 177 & 178

ENGINEERING AND THE ENVIRONMENT

INTRODUCTION

The probable effects of the proposed construction on hydrology and channel studies, air pollution, noise levels and water quality were investigated. Geologic and climatic factors were also considered because of the limitations they impose on construction practices and on the subsequent use of the facility.

Each of the four alternate routes were examined and analyzed individually and their degree of impact in each study category was rated and is shown on the Impact Evaluation Chart at the end of this section.

GEOLOGY:

The mountains of this area are believed to have developed during the geologic Early Tertiary period They are primaril composed of the igneous intrusion known as the Boulder Batholith which extends from Helena for 60 miles to the area south of Butte With the exception of recently deposited sand, gravel and other surface debris, most of the rock in this area is granitic in composition

The general geology of the area is shown on the Geology Map following this section, and is comprised of data taken from the Geologic Map of Montana, 1965, and from reconnaissance geologic mapping which was done by the Montana Department of Highways' Geologist.

Gray, medium grained quartz monzonite is the most common rock in the Boulder Batholith The main compositional variation is in the potash feldspar - plagioclase content; varying from granite to granodiorite Roughly contemporaneous dikes and masses of alaskite and aplite are common.

The Cretacious Volcanics which are older than the batholith rocks, are predominantly welded tuffs and related intrusive rocks The composition is predominantly andesitic and quartz latite

The Tertiary Volcanics are represented by quartz latite of Oligocene age and rhyolite of Miocene-Pliocene age. The quartz latite rocks are predominantly sandstones, tuffs, flows and related intrusives The rhyolites are mainly flows, tuffs and related intrusives.

Strongly folded and fauled lower Paleozoics of sandstone, shale and limestone are occasionally present in widely scattered locations, particularly in the southern Elkhorn Mountains and near Cardwell.

Tertiary sediments in the major valleys are composed of gravels, silty-sands and clays with sources in the adjacent mountains. These were deposited during periods of block faulting and can be hundreds of feet thick. Quaternary alluvium is represented by sands and silts of recent deposition in and adjacent to the major streams.

Both the batholith rocks and the Cretacious Volcanics display prominent joint sets (some steeply dipping) and faulting. The faults occasionally cut rocks as recent as the Tertiary sediments. The broad outlines of the mountain ranges and intervening valleys were produced by block faulting.

Subsequent modifications by erosional processes in the major valleys have left several paired terraces. Alluvial fans are present at the mouths of the smaller streams. In the mountains, glaciation, mass wasting and stream erosion have been the dominant processes. Boulder strewn canyons are choked with mass-wasted debris and occasional bog and swamp deposits. Within the mountain rages an essentially dendritic drainage pattern has developed on the homogeneous rocks with a rectangular pattern superimposed due to the prevailing joint sets and faults.

Engineering Geology. The Basin Route and Nez Perce Route may be distinguished geologically from the Whitetail Route and the Boulder Valley Route because of major formation differences. The greater portions of the Basin and Nez Perce Routes lie within Cretaceous age rocks of Boulder Batholith origin while the Whitetail and Boulder Valley Routes have a great deal of their corridors lying within Tertiary age Clastic sediments. These variations create very different types of engineering and construction problems.

Inspection of the Basin and Nez Perce routes show that the valley bottoms are filled with relatively shallow deposits of sediment derived locally from the Boulder Batholith with some local areas receiving influence from Tertiary age volcanics. The Clastic sediments of these valleys are chiefly composed of silty sands with gradations ranging from feldspar derived clays on the fine fraction to boulders on the large end. From previous experience with sediments derived from the Boulder Batholith, the soils are in the A-4 to A-6 range (MDH Standard Specification Classification). The A-6 soil can be frost susceptible especially at higher elevations, the clays tend to be lean (non-swelling), and a great percentage of the boulders to be quite erodable. High sand content should make new embankment consolidation a negligible problem.

Steepness of cut and fill slopes is expressed as a rate of the horizontal measurement to the vertical measurement. For examplie in a 2:1 cut slope, the slope would be described as having a two foot horizontal distance for every one foot of vertical distance. In the areas where colluvium and talus are intercepted, the maximum allowable steepness of backslopes would in general be 1:1 in cuts less than 10 feet in height, and 1½:1 in deeper cuts. Essentially the same holds true for colluvium.

Where rock is intercepted in cut zones, much variation would exist as to maximum allowable steepness for backslopes. Generally speaking, prominent joint systems should be followed wherever they are parallel to the road and could possibly offer a plane for backslope failure. Natural saddles are usually zones of intense fracturing or zones of decomposition which may be as deep as 200± feet. Backslopes made through these zones may be variable but past experience has shown that 1:1 or 1½:1 slopes are advisable depending on cut height. Fault zones would undoubtedly control some backslopes but no active movement along faults is anticipated. Some of the more stable rock zones may possibly stand at ¼:1 with proper presplitting techniques, but other areas would indicate that ¼:L slopes would be the exception rather than the rule.

Wherever silty sand mantle has been produced by inplace weathering, it can be expected that this mantle will be gradational downward from loose soil on the surface through lesser degrees of weathering to solid bedrock. These zones may be as shallow as 10 feet or as deep as 70' - 100'.

Previous experience and calculations indicate that the silty sand overburden would probably have a shrink factor of 0.95, the rock may have a swell factor of about 1.05. This means that if one cubic yard of silty sand were excavated, placed in an embankment and compacted, the compacted volume would only amount to 0.95 cubic yards of material. Conversely one cubic yard of rock excavated and placed in an embankment would result in a quantity of 1.05 cubic yards. These factors are used to balance earthwork quantities.

Examination of the Whitetail and the Boulder Valley Routes reveals that construction would essentially be in unconsolidated sediments. The northern portion of the Whitetail Route is composed of intrusive and extrusive rock units and the above comments for the Basin and Nez Perce Routes apply. The southern portion of the Boulder Valley Route may encounter argillaceous Pre-Cambrian rock units. Recent construction in this area utilized a 1½:1 cut sope design in the deeper rock cuts. In general, most cuts should be constructed using the standard backslope designs, namely 1½:1 or flatter. These slope recommendations would also apply to the silty and sandy unconsolidated Tertiary age sediments which comprise a good portion of both of these routes.

The Tertiary sediments in the center portion of the Boulder Valley Route may require treatment for swelling subgrade soils. This is evidenced in existing State Route 281; however, the extent of this is thought to be in the order of 2,000 lineal feet for the entire route. Frost susceptible soil may also be anticipated in the design for these routes.

Shrink swell factors for these routes would be about 1.05 in the rock portions and about 1.00 in the Tertiary sediments. Soils engineering problems for these routes should be minimal.

Seismic Considerations. The map showing approximate zones of equal seismic probability in the United States indicates that the study area falls within Zone 3, in which major seismic damage may be anticipated in the event of an earthquake. This fact would be taken into consideration in the design of all major structures. No special consideration of seismic factors is used in roadway design, except that the backslope design in cut areas may change where fault zones are encountered.

In general, all of the alternate alignments would cross, be parallel to, or tangent to known faults. More fault structures show up in the Butte-Basin area, but probably only because it has been the object of more careful study in the past due to mining interests. The whole area is similar seismicly, but probably most of the recent small shock centers are toward the east. There has been no known fault slippage within the study area in recorded history. It is thought that the area has been stable for centuries and will probably remain so for centuries more.

The known major fault lines are shown on the Geologic Map. The entire study area is broken by numerous smaller faults which are impossible to show on this map. These smaller faults occur mainly along the Basin and the

Nez Perce Routes, and along the southern portion of the Boulder Valley Route.

No special problems are anticipated with respect to seismic activity in any of the study area.

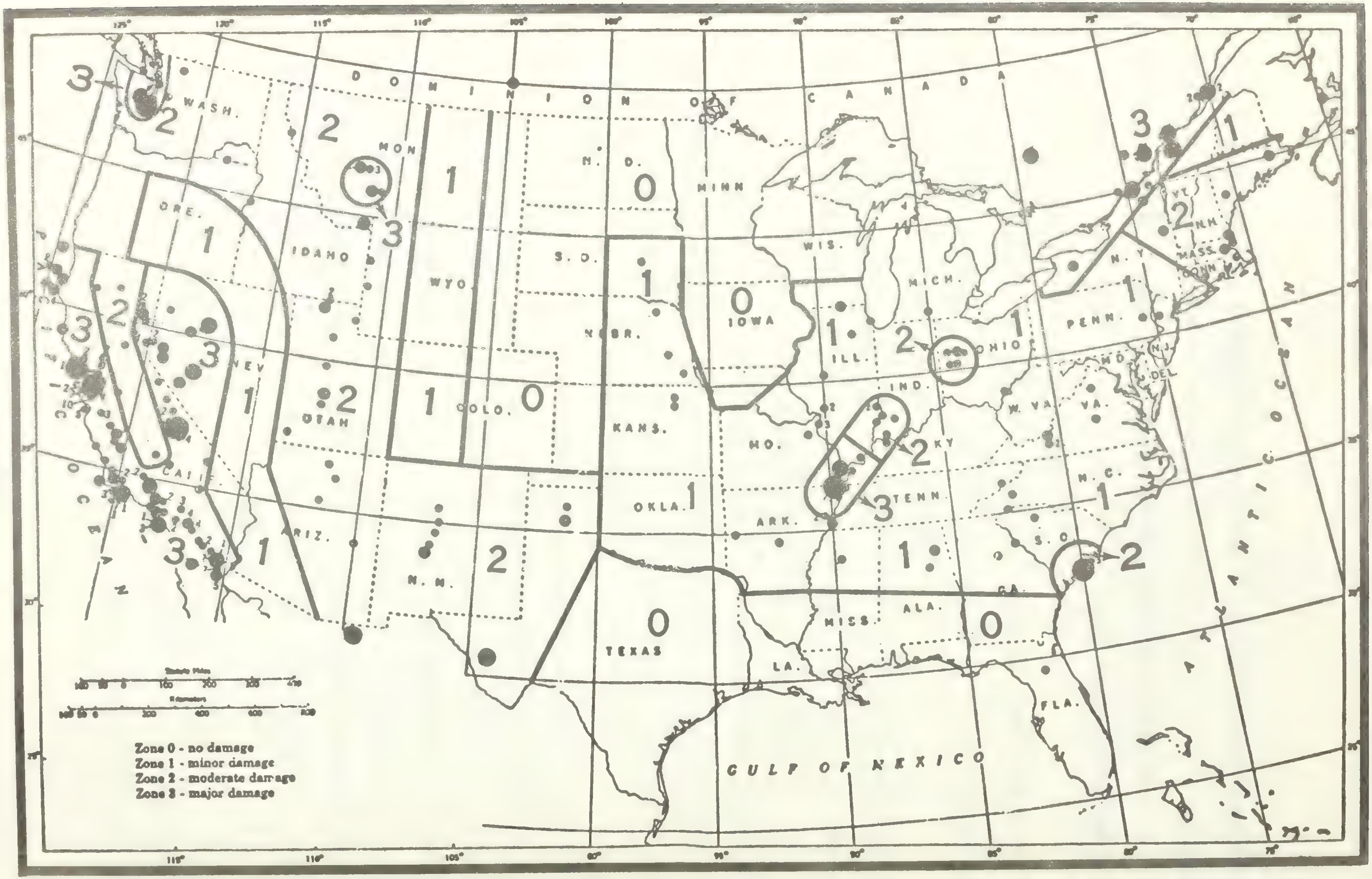
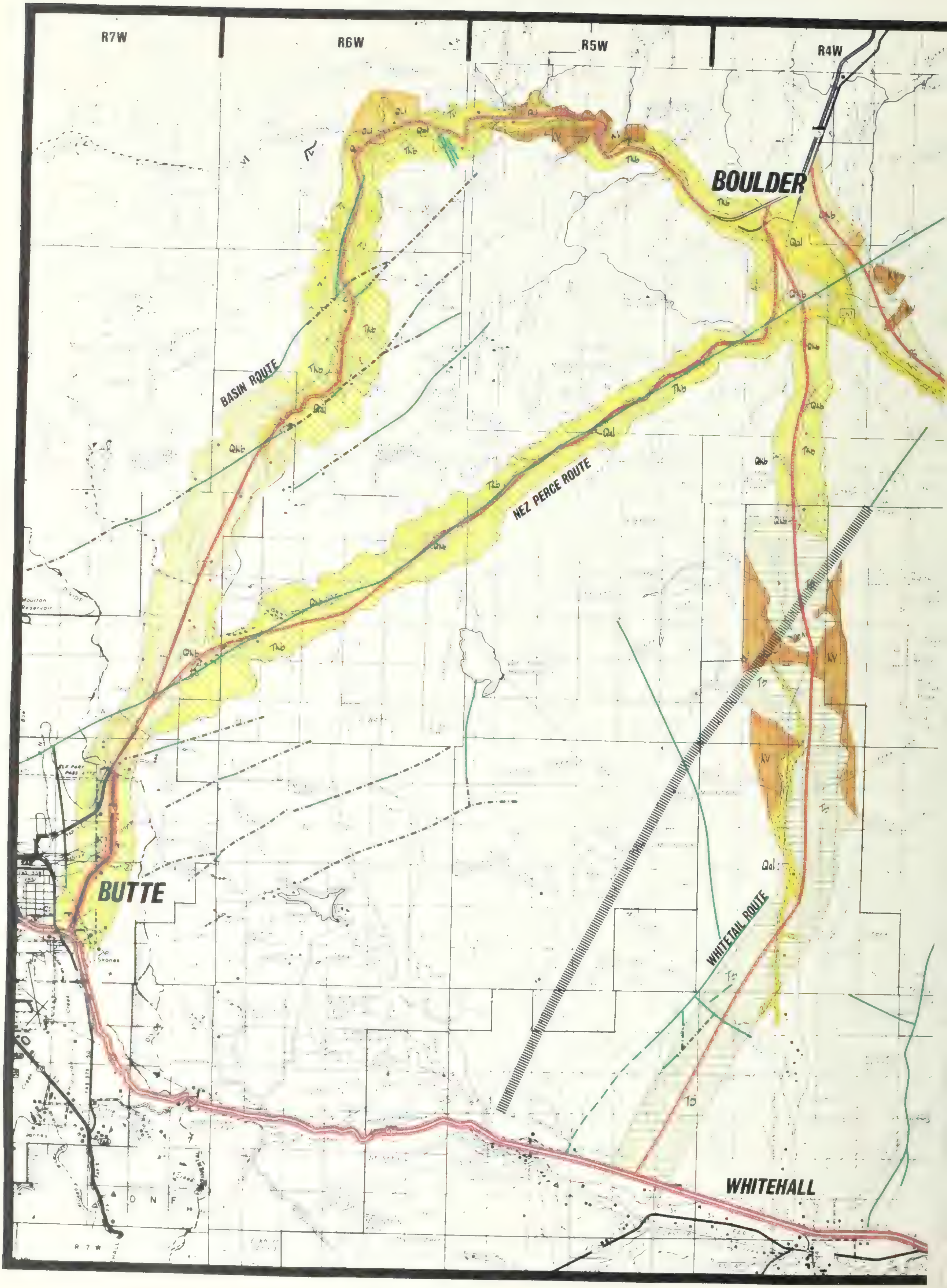
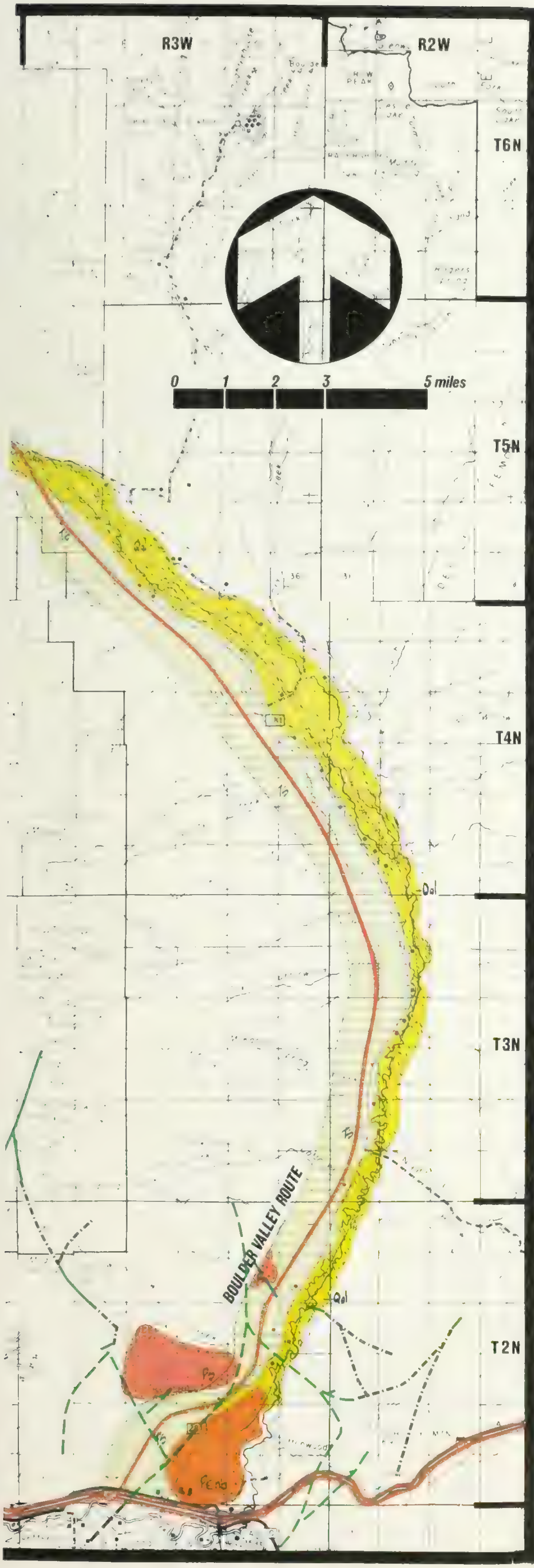


FIGURE 1.2 - MAP OF THE UNITED STATES SHOWING EPICENTERS AND ZONES OF APPROXIMATELY EQUAL SEISMIC PROBABILITY


R7W
R6W
R5W
R4W
BOULDER
BASIN ROUTE
NEZ PERCE ROUTE
WHITETAIL ROUTE
BUTTE
WHITEHALL
Moulton Reservoir
Elk Park Pass
Qal
Tkb
Qkb
Kv
Ts
R 7 W



GEOLOGY

Kv	CRETACEOUS VOLCANICS
penb	PRE-CAMBRIAN BELT ROCKS
Ps	LOWER PALEOZOIC ROCKS
Qal	QUATERNARY ALLUVIAL DEP.
Qcl	QUATERNARY COLLUVIAL DEP.
Qkb	COLLUVIAL OUTWASH DEP.
Tkb	TERTIARY ROCKS
Ts	TERTIARY SEDIMENTS
Tv	TERTIARY VOLCANICS
-·-·-	KNOWN FAULT
——	PROBABLE FAULT
- - -	INFERRED FAULT
‖‖‖‖‖‖	INFERRED LINEAMENT OF WEAKNESS

prepared by:
WIRTH ASSOCIATES
ENVIRONMENTAL PLANNING and DESIGN
BILLINGS MONTANA

HYDROLOGIC AND STREAM CHANNEL STUDIES

Adequate provision for the passage of streamflow is an important phase of highway planning. Topography, highway standards, and safety and economy often dictate the need for encroachment and relocation of stream channels and the crossing of streams. The initial and long term impact of channel manipulation deserve and have received careful study along all alternate routes. Available records of streamflow and climatic data were examined to determine probable streamflow patterns and flood plain requirements.

In the early construction of railroads and highways, the primary consideration was to keep the stream from interfering with the roadway. However, attempts are made to keep the roadway away from the stream wherever this is impossible. The consideration of aesthetic and ecological factors has resulted in designs that will minimize the undesirable effects of those stream manipulations which are unavoidable.

In general, channel changes result in a reduction in stream length through the elimination of pronounced meanders. Bridges and culverts can also distrub stream channels, both upstream and downstream. In some instances, channel changes can be less disruptive than the placement of a series of culverts Protection against scour at the downstream end of culverts and the erection of low baffles on the lower part of the culvert, reduce the undesirable effects of culverts on steep slopes. The object of the latter measure would be to aid the movement of fish.

Basin Route

Based on preliminary studies, there would be approximately 18,600 lineal feet of altered and new channel on the Boulder Riber if this route were constructed. About 14,100 feet of these changes would be made in replacement of existing artificial channels created through earlier highway and railroad construction.

A beneficial effect would be the reclaiming of 3,200 lineal feet of original channel, most of which occurs near Mile 152, by breeching the abandoned Burlington Northern railroad grade. This action would increase the length by taking advantage of the previously abandoned natural meanders.

The total revised channel length of 21,800 lineal feet (18,600 + 3,200) would a net reduction of 800 feet and this would increase the velocity of the current in some areas. These velocities, however would still not be as high as those occurring naturally in other sections of this river.

The most extensive shortening of the Boulder River channel over a considerable reach would occur in the vicinity of the proposed Galena Interchange at approximate Mile 160.5.

Bison Creek from Mile 143 to the Shamrock Campground would require many changes to accommodate the highway construction. Some of these changes involve routing the Creek in the median between separated traffic lanes. About 20,200 L.F. of the present channel would be altered although some 12,00 L.F. has been previously altered. This would be replaced by 15,600 ft of new channel and 5,100 ft. of reclaimed original channel which had been abandoned due to a previous channel alteration. This would result in a net gain of approximately 500 ft. of channel length.

Nez Perce Route

Channel changes on this route are confined to the Little Boulder River. About 18,600 L.F. of the present channel would be replaced by about 17,000 ft. of new channel. The length of the new channel would be about 9% shorter than the natural channel being replaced. The reaches affected by channel changes are generally long and steep, with stream profile slopes ranging from about 3 to 8%. In many instances, they would involve rock cuts on the sidehill as the canyon bottom is narrow. Increases in velocity due to channel changes would be slight, although velocities up to about 10 ft. per second would and do occur at high floods in the steeper reaches. The placement of rock at intervals would enhance the appearance of the altered stream and help restore fish habitat as well as reduce velocity. The narrow canyon would generally permit little curvature to the replacement channels. Six culverts are planned on the Little Boulder and one on Nez Perce Creek. This excludes culverts on tributaries of these two principal streams. Baffles on the lower part of the culverts could provide shelter or resting areas for migrating fish. Impact on the streams of this route is rated high.

Whitetail Route

Channel changes with this alternate route would be confined to the drainage of a small tributary of Beaver Creek having a drainage area of less than two square miles, and would probably involve few encroachments by the toe of fill of highway embankments. To avoid interference with a proposed damsite on the Little Boulder River, the crossing of that stream would be located below the mouth of Beaver Creek. The entire route would involve relatively few stream crossings. It would have very little affect on the present appearance of the streams or their utilization for fishing or recreation. Impact on the streams of this alternate route is considered low.

Boulder Valley Route

This route which would connect with I-90 east of Whitehall, would be located in the broad valley of the Lower Boulder River. No relocation of stream channels would be required. Hydrologic structures would consist of one bridge for a stream crossing. This disturbance to stream channels would be less than that of any of the other routes. The impact rating for this alternate is considered to be low.

AIR POLLUTION:

Auto Emissions. A number of gases, vapors and types of particulates are recognized as air pollutants. Of these, six are generated from vehicular transportation, and have been classed as among the most important: (1) Carbon Monoxide(CO); (2) Hydrocarbons(HC); (3) Oxides of Nitrogen(NO_x); (4) Smoke and particulate matter; (5) Lead; and (6) photochemical smog. With the exception of photochemical smog, these are called primary pollutants because they are the products emitted from vehicles. Photochemical smog is the result of a reaction in the atmosphere among oxides of nitrogen, hydrocarbon and other pollutants in the presence of sunlight. The primary set of measures ordinarily used are the hourly emission by type of hydrocarbons (HC), carbon monoxide (CO) and the oxides of nitrogen (NO_x). As far as can be determined, data on lead and smoke particulate emission as a function of driving conditions, have not been collected Neither is it possible to predict the concentrations of photochemical smog. In this study, five situations were considered. They include the four alternate routes, as well as a no-build alternate.

It should be noted that the pollution performance of vehicles is based on limited data and should be used with the understanding that the design of vehicles to meet the emission requirements specified by the Federal Government is not yet firm. These calculations assume, however, that improved performance with respect to vehicle emissions will be forthcoming due to the requirement of expected future legislation.

Automotive emissions for each of the alternate considerations were calculated for estimated peak hour traffic and for off-peak hour traffic, for the year 1997.

These values are shown on Table 13 and on Figure 17, and can be compared with the no-build alternate which uses a projection of future traffic on the existing road network. The method of computation used was as described in the Highway Research Board Report 133 entitled "Procedures for Estimating Highway User Costs, Air Pollution and Noise Effects".

VEHICLE EXHAUST EMISSION						
ALTERNATIVE	HYDROCARBON LEVELS HC**		CARBON MONOXIDE LEVELS CO**		OXIDES OF NITROGEN LEVELS NO_x **	
	Peak	Off-Peak	Peak	Off-Peak	Peak	Off-Peak
No-build Alternative	5.96	2.71	248	118	62	32
Alternative 1 BASIN	5.83	2.80	253	123	63	33
Alternative 2 NEZ PERCE	5.65	2.62	223*	110*	60	37
Alternative 3 WHITETAIL	5.46*	2.61*	231	112	59*	28*
Alternative 4 BOULDER VALLEY	5.73	2.97	249	119	63	32

*Lowest Value
**Pounds/1000 vehicle miles

TABLE 13

The results of the emission estimates shown on Table 13 and Figure 17 indicate there is not a marked difference between the no-build alternate and any of the alternate improvements under consideration. This is because there is not a great deal of difference in the type of operation expected from any of the facilities. In all of the considered conditions, there are few, if any, stops; there are not expected traffic bottlenecks, and although the expected running speeds may be different on the proposed

INTERSTATE 15

BUTTE TO BOULDER

VEHICLE EXHAUST EMISSION

FOR THE YEAR 1997

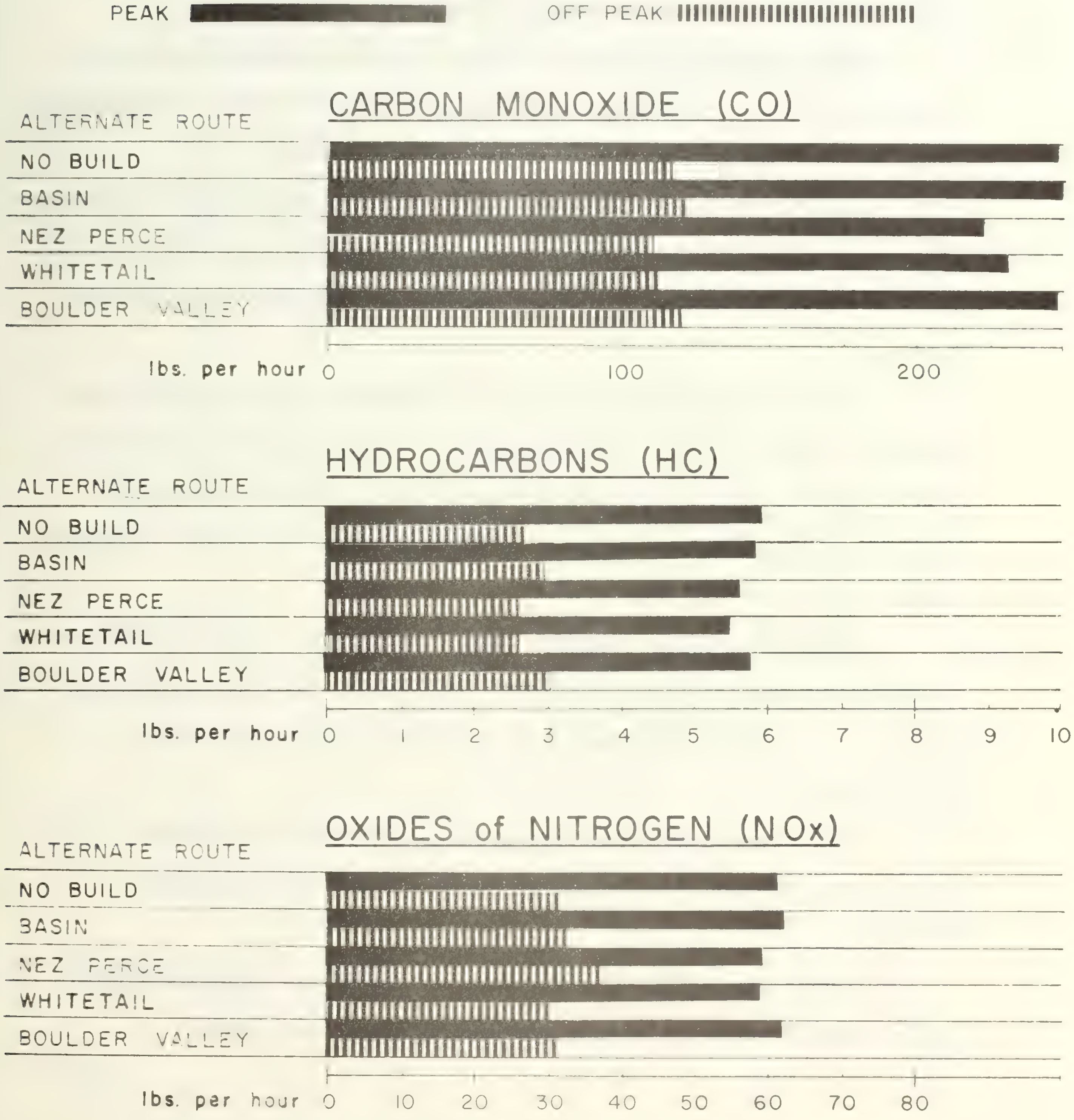


FIGURE 17

necks, and although the expected running speeds may be different on the proposed facilities, a smooth flow of traffic is in general expected in all situations including continued use of the existing highways. The relative impact of automobile emissions is rated as light on all alternates.

Other Air Contaminants. The other major air pollutants which may increase as a result of construction, would be emissions from hot plant operations and dust produced by normal construction operations.

Ambient air quality standards were adopted by the Montana Legislature with the enactment of the 1967 Clean Air Act of Montana. The Montana State Board of Health is charged with the responsibility of enforcing these regulations.

Montana Board of Health Regulation 90-0004 regulates the air contaminants produced by hot plant operations. It requires that a contractor obtain a permit before beginning operations and it requires that any industrial process limit the emission of particulate matter to the given standards outlined in this regulation.

Regulation 90-0005 requires that no person shall allow controllable particulate matter to become airborne. This covers the road construction process and may require such measures as watering dusty construction areas, etc.

Regulation 90-007 restricts emission of visible contaminants. This permits regulation of particulate emissions without the necessity of testing.

Regulation 90-010 restricts open burning of any type except under certain conditions which must be approved by the Control Officer.

The increasing use of the dryer-drum mixing process in the production of asphaltic surfacing materials during paving operations produces significant reductions in dust emissions and may find application on this project.

The contractor will be required to comply with existing regulations as stated in the Montana Department of Highways Standard Specifications for Road and Bridge Construction, 1970, Edition as amended.

Based on the analysis and the results shown on Table 13 and Figure 17, it is believed that any adverse environmental impact from air pollution would be approximately the same for all alternate routes under consideration. The adverse environmental impact is considered to be low.

NOISE LEVELS:

The most common source of noise during construction will be produced by construction equipment Upon the completion of construction, the vehicular traffic along the new facility will create the greatest amount of noise Predictions of generated noise from vehicular traffic were calculated using the Montana Department of Highways computer program.

In this study, each route was examined to determine the most probable location of noise problems. These would be created in areas of steep grades, of sharp curvature and in areas in which noise would be most objectionable: i e , campgrounds or populated areas Several locations along each of the routes were selected and noise prediction calculations were made. These locations and the resulting noise level predictions are given on Table 14 Table 15 is reproduced from (Federal Highway Administration) FHWA PPM 90-2 and shows design noise levels and land use relationships. Table 16 lists allowable design noise levels at different type of buildings as set forth in FHWA PPM 90-2

The values given in these tables are in decibels A (dBA). This is the sound level in decibels measured on the A-scale of a standard sound level meter. A unit of one decibel is a barely audible sound, and a change in sound level of one decibel is barely noticeable to a trained observer, whereas a three decibel change is easily noticeable to most people Some examples of commonly heard sounds are as follows: 45 decibels is the sound associated with an average residence; 60 decibels represents quiet residential traffic at 15 feet from the pavement edge; 65 decibels represents conversational speech at 3 feet; 75 decibels represents downtown traffice in large cities at the sidewalk; and 90 decibels is the average peak noise from diesel trucks at about 35 feet from the pavement edge.

Predicted noise levels on each of the four alternate routes indicate that allowable standards are met at every location tested as indicated on Table 14. The low traffic volumes account for this. Adverse impact due to noise is judged to be low on all alternate routes.

Table 17 lists noise levels which were actually measured along the existing roads These values are not directly relatable to the predicted values shown previously because traffic volume on the new facility would be different and so would the relationship between the sound source and the observer They do however indicate that present noise levels are relatively low at the locations tested

Noise barriers of various types can be placed along roadways to reduce noise to an acceptable level These include shrubbery, trees or physical barriers. One of these methods could be employed in Basin, for example, to minimize the impact from noise if required to meet standards.

WATER QUALITY

The quality of the surface runoff water adjacent to the alternate routes of study are considered here with respect to the effect that construction or channel alterations may have on the streams. This may occur in the form of turbidity, sediment or settleable solids, or residues such as oils, floating solids and sludge deposits Other impurities may include toxic minerals which could be uncovered by distrubing the natural ground and introduced to the stream during the construction process from heavy rain runoff or from distrubing the channel in some other manner. Allowable

PREDICTED NOISE LEVELS (1997)

STATION LOCATION	PREDICTED NOISE LEVELS, L_{10} dBA	ALLOWABLE STANDARD, dBA	COMPLIANCE
BASIN ROUTE			
Elk Park Campground, Mile 145	40.65	60	x
Shamrock Campground, Mile 148	38.02	60	x
Bernice, Mile 151	44.22	-	Not Required
Basin, Mile 155	49.13	70	x
NEZ PERCE ROUTE			
Elk Park Flats, Mile 136	62.10	-	Not Required
Sawmill Gulch, Mile 139	40.49	75	x
Little Boulder Park, Mile 144	51.46	-	Not Required
Moose Creek Interchange, Mile 148	50.37	60	x
WHITETAIL ROUTE			
Ranch at Mile 143	36.62	70	x
Boulder School Rec. Area, Mile 153	44.19	70	x
Mile 155	63.93	-	Not Required
BOULDER VALLEY ROUTE			
Boulder Cemetery, Mile 157	47.24	60	x
Elkhorn Interchange, Mile 151	45.76	x	Not Required
Mile 128	61.08	x	Not Required

L_{10} = Noise levels which are exceeded 10% of the time
dBA = Decibels measured on the A-Scale of a sound level meter
x = Compliance achieved

TABLE 14

MAXIMUM NOISE LEVEL VALUES AS RELATED TO LAND USE - Per FHWA PPM 90-2

Land Use Category	Design Noise Level - L_{10}	Description of Land Use Category
A	60dBA (Exterior)	Tracts of lands in which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks, or open spaces which are dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet.
B	70dBA (Exterior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, picnic areas, recreation areas, playgrounds, active sports areas, and parks.
C	75dBA (Exterior)	Developed lands, properties or activities not included in categories A and B above.
D	--	For requirements on undeveloped lands, see paragraphs 5a(5) and (6), this PPM.
E	55dBA (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.

TABLE 15

NOISE STANDARDS (dBA)

Building Type	Window Condition	Noise Reduction Due to Exterior of the Structure	Corresponding Highest Exterior Noise Level Which Would Achieve an Interior Design Noise Level of 55 dBA
All	Open	10	65
Light Frame	Ordinary Sash Closed w/Storm Wind.	20 25	75 80
Masonry	Single Glazed	25	80
Masonry	Double Glazed	35	90

TABLE 16

MEASURED NOISE LEVELS

STATION LOCATION	RECEIVER LOCATION IN FEET FROM CL OF PTW	MEASURED NOISE LEVEL IN dBA
Elk Park Campground, Mile 145	141*	53.58
Shamrock Campground, Mile 148	324*	48.66
Bernice, Mile 151	230**	51.10
Carlson Ranch, Mile 152	291***	50.16

*Closest camping spot to PTW
**Bison Creek is 100 feet the other side of the receiver
***Ranch House is 50 feet the other side of the receiver

TABLE 17

amounts of impurities which may be present in the water are outlined in Montana's Water Quality Standards. These Standards were originally adopted by the State Water Pollution Control Council in 1967. In 1971, the State Water Pollution Control Act was revised, which turned functions of the Council over to the State Board of Health and Evnironmental Sciences

The Montana Highway Department also regulates the amount of exposed cut area which can be opened at one time and requires that proper precautions be taken against erosion and against runoff from cut slopes which could cause muddy stream water The guidelines for these controls are outlined in FHWA Instructional Memorandum 20-3-66, 20-6--67, and 20-3-70

Basin Route

No long term water quality sampling has been done along the Boulder River. According to a statement from the Montana Department of Health and Environmental Sciences (see appendix p171) limited data which are available indicate that generally the water quality of the Boulder River is good However, heavy metals from acid mine drainage and sediments from abandoned metal mines periodically affect water quality in Basin, Cataract, and High Ore Creeks and in the main Boulder River into which they drain below the town of Basin. Sediment deposition is most noticeable from Basin to Boulder Higher than normal concentrations of heavy metals are present from Basin downstream to the mouth of the Boulder River

Fish sampling data gathered by the Montana Department of Fish and Game in August, 1973 (see appendix p 172) provide a measurement of the significance of this pollution These data indicate that the fish populations in the Boulder River above the community of Basin are "normal". Below Basin, fish populations are smaller and fewer species are present. The poorer fish populations below Basin are probably due to the effects of sedimentation and heavy metals from the mine wastes.

Fish sampling data from Bison Creek show larger populations than thos in the Boulder River above Basin This is an indication that the water quality of Bison Creek is equal to that of the Boulder River above Basin.

The potential impact is considered to be medium.

Nez Perce Route

Although no water sample data was available on the Little Boulder River, it is suspected that the water quality here is superior to that of the Boulder River and Bison Creek because this stream has been virtually undistrubed by man's past activities. Considerable damage to the river would probably occur as a result of road construction because the narrow canyon leaves little room for taking precautionary measures against water pollution. It is expected that the impact on this stream would be high.

Whitetail Route

No water quality sample data were available on Whitetail or Little Whitetail Creeks However, the preliminary alignment preposed for this route does not affect either of these streams. One crossing of Whitetail Creek and one crossing of Little Whitetail Creek is all that is expected, and very little additional water pollution is expected to be introduced at these locations. The potential impact of this route is considered low.

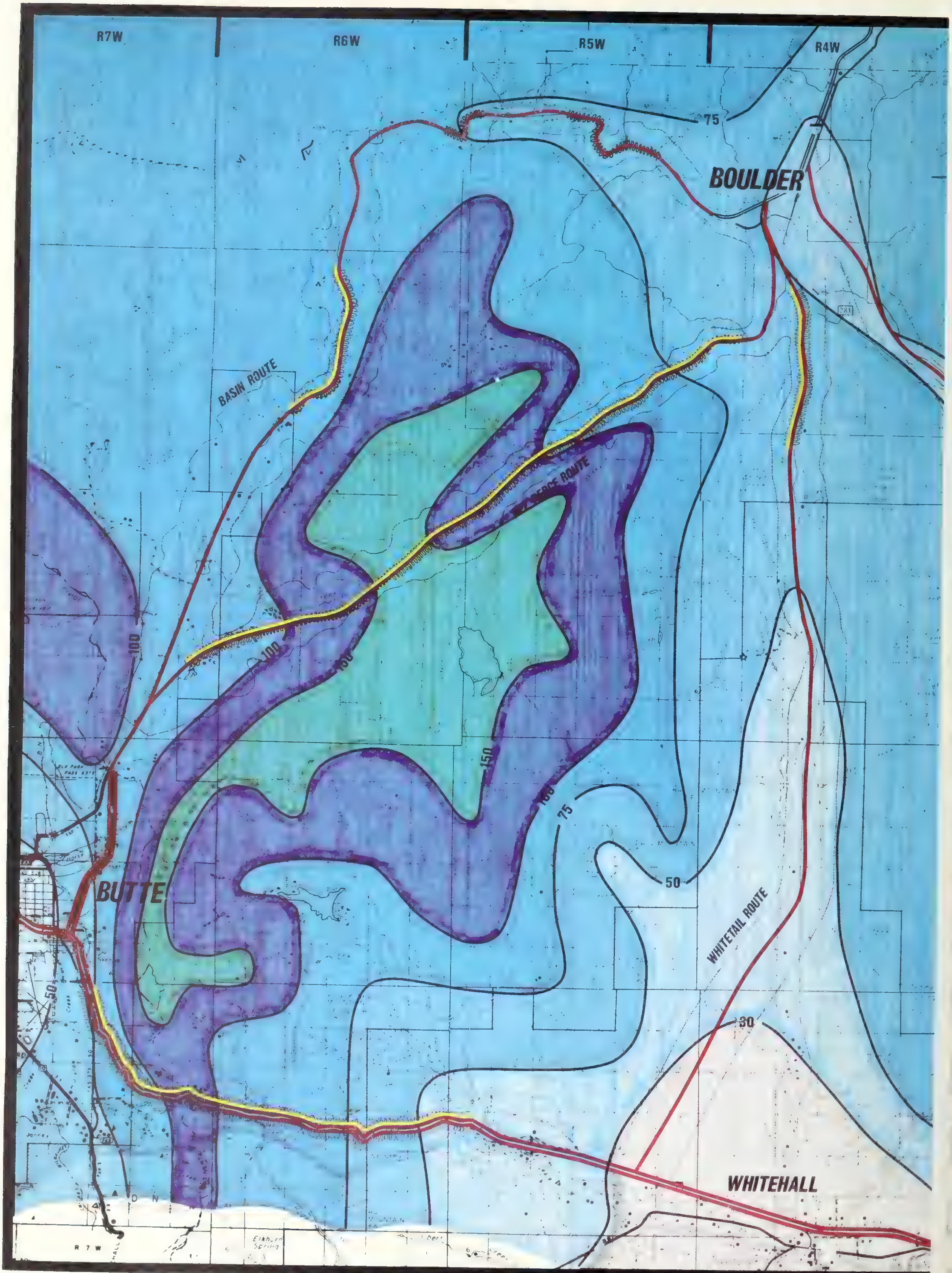
Boulder Valley Route

The alignment alternate which was studied on this route crosses the lower Boulder River with a bridge only once. No water quality sample data were available for these stream waters, but it is expected that the Interstate construction in this area would have little, if any, affect on the water quality. The potential impact is considered to be low.

CLIMATE

In evaluating the role of climate as related to each of the four alternate routes, the primary concern is with winter maintenance problems which, in turn, is related to annual average snowfall and icing conditions due to shaded areas and steep grades. Any area which presents a maintenance problem also presents a hazard to the driver. The Climate map shows isolines of average annual snowfall in inches between the years 1953 and 1967

The heaviest snowfall areas occur along the continental divide which is crossed by each of the four alternate routes. However, information received from the Montana Highway Department District Maintenance Forces indicate that they expect the most severe maintenance problems would occur on the Nez Perce route due to the extended 5% grades and high elevations, and on the Whitetail and Boulder Valley Routes due to extended steep grades combined with sharp curvature which the driver encounters in crossing the continental divide at Homestake Pass near Butte. (See Route profiles on Figure 6 .) The Nez Perce Route is rated as having the highest impact. The Whitetail and Boulder Valley Routes are rated medium and the Basin Route has the least impact with regard to climatic effects.


R7W
R6W
R5W
R4W
75
BOULDER
BASIN ROUTE
ERCE ROUTE
100
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150
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BUTTE
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WHITETAIL ROUTE
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WHITEHALL
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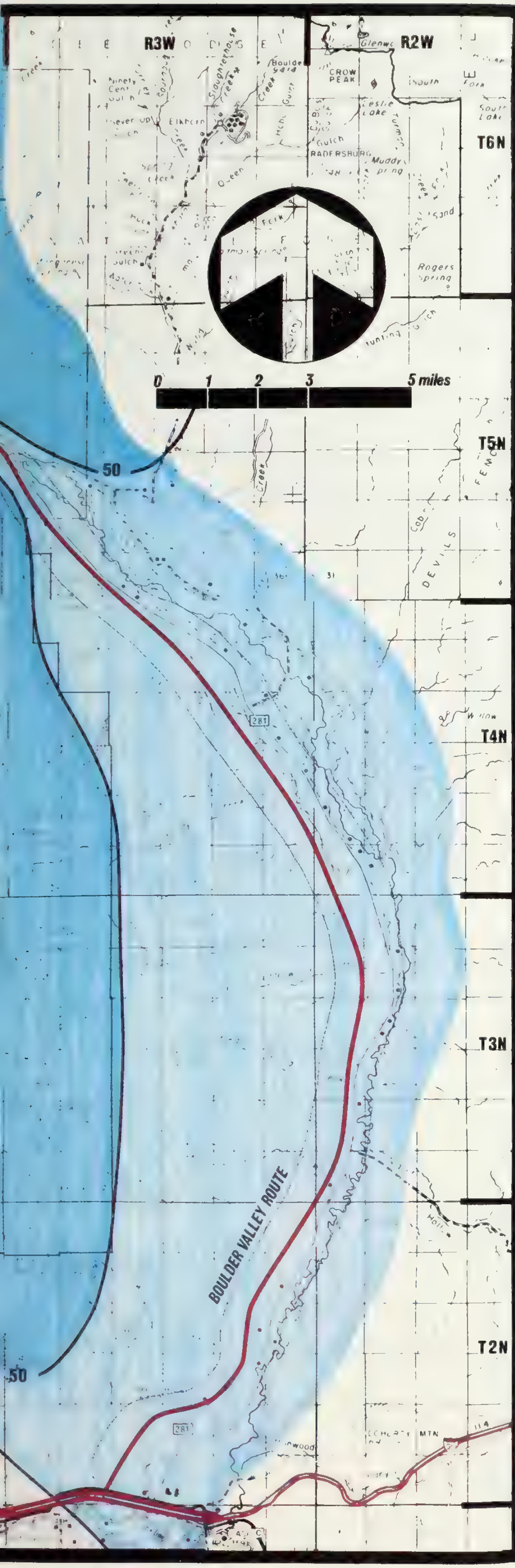


CLIMATE

*

— AVERAGE ANNUAL SNOWFALL IN INCHES 1953-67

▨ CRITICAL WINTER MAINTENANCE AREAS

*

PREPARED BY SCS SNOW SURVEY
BOZEMAN, MONTANA

prepared by:
WIRTH ASSOCIATES
ENVIRONMENTAL PLANNING and DESIGN
BILLINGS MONTANA

SUMMARY OF IMPACT RATINGS

The following Impact Evaluation Chart shows the relative general rating of each of the categories studied in this section. The overall relative rating for this section on Engineering and the Environment is in Section VII, Evaluation and Route Selection.

As stated before, these rating charts are intended to be an aid to the reviewer and only indicate relative impact. They cannot be averaged or totaled numerically to arrive at a total impact rating for an alternate route.

IMPACT EVALUATION – ENGINEERING and the ENVIRONMENT

COMPONENT	ROUTE			
	BASIN	NEZ PERCE	WHITETAIL	BOULDER VALLEY
GEOLOGY & SEISMIC	◍	◍	◍	○
HYDROLOGIC & CHANNEL STUDIES	●	●	○	○
AIR QUALITY	○	○	○	○
NOISE LEVELS	○	○	○	○
WATER QUALITY	◍	●	○	○
CLIMATE	○	●	◍	●

HIGH IMPACT	●
MEDIUM IMPACT	◍
LOW IMPACT	○

APPENDIX
TO
SECTION III

ENGINEERING AND THE ENVIRONMENT

Department of Health and Environmental Sciences
STATE OF MONTANA HELENA, MONTANA

John S. Anderson M.D.
DIRECTOR

August 14, 1973

Mr. Ralph Boland
Fish and Game Department
Helena, Montana 59601

Dear Mr. Boland:

Attached are data from the Boulder River. We have extensively sampled streams in the area, but do not have a large number of samples from the Boulder River above Boulder. Acid mine drainage from abandoned metal mines affects water quality in Basin, Cataract and High Ore Creeks and to some extent in the main Boulder River below Basin. Erosion of mill tailings from the Comet Mine and Jib Mine areas causes periodic sediment and metals problems in the main stream.

Generally, water quality in the Boulder River is good. Minor amounts of trace metals are present, especially during erosion of the old mill tailings. Based on limited data, heavy metal concentrations in the water above the community of Boulder appear to be similar to those below Boulder. Based on our examination of the stream, the two most important factors effecting water quality are sediment from mill tailings and heavy metals from acid mine wastes. Higher than normal concentrations of heavy metals are present downstream to the mouth of the Boulder River. Sediment deposition is most noticeable from Basin to Boulder. The water is a calcium-bicarbonate water low in dissolved solids and typical of water draining from granitic intrusive rocks.

Very truly yours,

Maxwell K. Botz, P.E.
Water Quality Bureau
Environmental Sciences Division

MKB:mg

Attachments

STATE OF MONTANA

DEPARTMENT OF

FISH AND GAME

Helena, Montana 59601
August 30, 1973

Mr. H. J. Anderson
Director of Highways
Department of Highways
Helena, Montana 59601

Attention: Jerry Anders

Dear Mr. Anderson:

I am attaching a copy of fish population information collected from the Boulder River and Bison Creek in August, 1973. These are summaries of data gathered. If you have need for the raw field data, we would be glad to supply it.

The information in the first table is a summary of all population work done and in Table 2, estimates of fish per 1000 feet of stream are included. Estimates were made only on the four stations listed because resampling is necessary to determine the number of fish caught previously and marked, to the porportion of fish which, for one reason or other, were not collected the first time the sampling run was made.

We have stated that the fish population above the community of Basin is satisfactory and normal, considering the conditions under which sampling was collected. Both streams were very low at the time of sampling but contained higher numbers of fish and more diverse species of fish above Basin than below Basin. As one would suspect, poorer fish populations were evident below known sources of pollution from High Ore Creek and Cataract Creek.

The samll size of fish collected indicates natural reproduction of all species in the stream system. Incidentally, these data do not include hatchery fish captured, which as I recall, was probably less than ten in the entire sampling effort.

Note that the average size of fish is medium. This is as expected in streams such as these that do not maintain water volumes or have the basic habitat to support a large fish fishery. This is partially an effect of past channelization of the stream.

Note also the relative abundance of dace and cottus. Generally, dace are very tolerant of poor water quality and cottus are very sensitive to poor water quality. Fish sampling in this area indicates an almost classic example of the reliability of these species as indicators of water quality. Cottus are abundant at all stations above Basin, common at Basin and become scarce to absent as one proceeds downstream. Dace, on the other hand, are most abundant in the polluted area of the Boulder.

If you have any further information concerning these data, please feel free to contact this office.

Sincerely,

Ralph W. Boland

Ralph W. Boland, Assistant Administrator
Environment and Information Division

RWB:jd
encl.

Date Recd. Precinct 8-30-73
Act | Info | MAIL ROUTE | Attach | Initial
J.R. Beckert

MONTANA DEPARTMENT OF FISH AND GAME
ENVIRONMENT AND INFORMATION DIVISION

Fisheries Survey Data from the Boulder River and Bison Creek
August, 1973

Location	Section Length	Species	Sample Size	Smallest	Largest	Average Size	Additional Species Present
Boulder River below Galena Gulch	537 ft	Rb	11	6.7	9.4	7.9	Dace-Abundant
Boulder River above Galena Gulch	500 ft	Rb	15	4.1	9.7	6.8	Dace-Abundant
		Wf	2	4.5		4.5	
Boulder River above High Ore Cr.	500 ft	Rb	25	4.4	11.6	7.7	Dace-Abundant
		Wf	3	2.0	11.6	5.5	Cottus-Scarce
Boulder River at R.R. bridge by Pacific Silica Quartz mine	500 ft	Rb	24	4.9	10.3	7.6	Dace-Common
		Wf	7	5.6	11.7	8.1	Cottus-Scarce
Boulder River in Basin	425 ft	Rb	21	4.5	10.1	6.7	Dace-Common
		Wf	9	5.8	17.6	9.9	Cottus-Common
Boulder R. above Basin at second railroad bridge	537 ft	Rb	48	3.9	10.3	7.4	Cottus-Abundant
		Wf	12	5.7	14.8	10.3	Dace-Common
		Eb	4	6.8	13.0	8.6	
Boulder R. below Indian Head Rock-R.R. altered section	537 ft	Rb	30	4.3	10.6	6.7	Cottus-Abundant
		Wf	24	5.1	12.6	9.0	Dace-Common
		Eb	11	4.8	10.0	6.7	
Bison Creek above Shamrock Campground	527 ft	Rb	55	3.5	8.9	5.4	Cottus-Abundant
		Wf	1	9.5			Dace-Scarce
		Eb	5	6.7	12.4	9.3	

②

MONTANA DEPARTMENT OF FISH AND GAME
ENVIRONMENT AND INFORMATION DIVISION

Estimates of Fish Populations in the Boulder River and Bison Creek
August, 1973

Location	Section Length	Species	N_1	N_2	N_{12}	Size Range	Population Estimate	No. Fish/1000
Boulder R. above Basin at second railroad bridge	537 ft	Rb	48	20	12	3.9-10.3	78	145
Boulder R. below Indian Head Rock R.R. altered section	537 ft	Rb	24	10	5	4.3-10.6	44	82
Bison Cr. above Shamrock Campground	527 ft	Rb	55	63	29	3.1-9.0	117	222
Bison Creek at Elk Park Campground	574 ft	Rb	46	49	23	3.9-10.7	96	167

Estimates of the populations were based on the Peterson Method (Bailey modification) using formula 5 of the Michigan Institute for Fisheries Research (1960):

$$\text{Population Estimate} = \frac{N_1(N_2+1)}{(N_{12}+1)}$$

N_1 = Number of fish caught, marked, and released in the first sample

N_2 = Total number of fish caught in the second sample

N_{12}= Number of recaptures in second sample

Fisheries Survey Data from the Boulder River and Bison Creek - Page 2

Location	Section Length	Species	Sample Size	Smallest	Largest	Average Size	Additional Species Present
Bison Creek-Elk Park Campground	574 ft	Rb	46	4.0	9.2	6.7	Cottus-Abundant
		Eb	5	4.7	9.5	5.8	Dace-Scarce
		CSU	5	6.4	10.6	9.3	

REFERENCES

WATER QUALITY

1. Water Quality Criteria, (including Appendum No. 1), State Water Pollution Control Board, Sacremento, California; Publication No. 3, Second Printing, 1957.

2. Water Quality Criteria, Federal Water Pollution Control Council.

3. Water Quality Criteria, State of Montana Water Pollution Control Council, adopted Oct., 5, 1967

NOISE LEVEL

1. Report No. DOT-TSC-FHWA-72-2
Manual for Highway Noise Prediction (Short Version)

2. Highway Research Board, NCHRP Report 117, Highway Noise, A Design Guide for Highway Engineers.

3. Highway Research Board, NCHRP, 133, Procedures for Estimating Highway User Costs, Air Pollution and Noise Effects.

AIR POLLUTION

1 Highway Research Board, NCHRD Report 133, Procedures for Estimating Highway User Costs, Air Pollution and Noise Effects.

GEOLOGY

1. George E. Becraft; Preliminary Geologic Map of the Southern Half of the Jefferson City Quadrangle, Jefferson County, Montana.; Mineral Investigations Field Studies Map, MF 172; U.S. Geological Survey (Fault Lines)

2 Harry W. Smedes, Montas R Klipper, Darrell M. Pickney, George E Becraft, E. T. Ruppel; Preliminary Geologic Map of the Elk Park Quadrangle, Jefferson and Silver Bow Counties, Montana; Mineral Investigations Field Studies Map MF 246; U. S. Geological Survey (Fault Lines)

3 George E Becraft, Darrell M. Pickney, Sam Rosenblum; Geology and Mineral Deposits of the Jefferson City Quadrangle, Jefferson and Lewis & Clark Counties, Mont.; Professional Paper 428; U. S. Geological Survey (Fault Lines)

4. S L Groff, Director and State Geologist, Montana Bureau of Mines and Geolog

5. Al Sawitke, Geologist, Montana Department of Highways.

SECTION IV

the NATURAL ENVIRONMENT

WIRTH ASSOCIATES
Environmental Planners Billings, Montana

Page

SECTION IV - THE NATURAL ENVIRONMENT

INTRODUCTION

Background -- 181
Acknowledgements -- 181
STUDY PROCEDURE --- 182
Flow Chart -- 184

IMPACT BY TOPIC

Procedure --- 185

Man Made Features

History & Archeology ------------------------------------ 186
Map 1 --- 192 & 193
Recreation -- 195 to 203
Map 2 --- 206 & 207

Natural Features

Physiography -- 209 to 216
Map 3 --- 218 & 219
Geology --- 221
Map 4 --- 226 & 227
Vegetation -- 229
Map 5 --- 232 & 233
Wildlife & Fisheries ------------------------------------ 235 to 249
Map 6 --- 252 & 253
Aesthetics -- 255 to 261
Map 7 --- 264 & 265
SUMMARY & CONCLUSIONS ----------------------------------- 267
Overall Impact Summation -------------------------------- 268
COMMITMENTS OF RESOURCES (NATURAL ENVIRONMENT) ---------- 269
APPENDIX TO SECTION IV ---------------------------------- 273
Agencies & Individuals Contacted ------------------------ 274
History and Archeology Report --------------------------- 275 to 303
Mont. Fish & Game Report -------------------------------- 304 to 326
REFERENCES -- 327 & 328

I. INTRODUCTION

BACKGROUND

On November 3, 1972, the firm of Wirth Associates, Environmental Planning Consultants, was retained to make an interdisciplinary study and analysis of the impact of the four alternates on the natural environment. This study covers certain natural and social sciences and the environmental design arts, and provides a comparative analysis of the four alternate routes. This assessment, togher with the monetary, engineering, and socio-economic assessments prepared by others, comprises the Environmental Impact Statement and provides a basis for the selection of one of the four alternates.

ACKNOWLEDGEMENTS

In assembling the data and acquiring the information needed to prepare the inventories and subsequent analyses of the different environmental components, a number of state and federal agencies were contacted. These include the U.S. Forest Service, the Bureau of Land Managment, Soil Conservation Service, U.S. Geological Survey, the Montana Highway Department, the Montana Fish and Game Department, and the Montana Bureau of Mines. Much information and assistance was also provided by Morrison-Maierle, consultants to the Montana Highway Department on this project.

The historical and archaeological information was provided by Western Interpretive Services.

A complete description of each of the four routes studied, as well as a discussion of the existing road network, is located in Section I, Route

Descriptions, Page 3. Aerial photography showing the general alignment accompanies each description.

II. STUDY PROCEDURE

The term "environment" is used to describe a complex system composed of interrelated natural and man-made components. When evaluating environmental impact, only those individual components inherent to the area and which would be affected by the proposed action become significant and need to be considered. Impact can be defined as alteration or change, generally considered to be negative. The natural and man-made components analyzed in this report, which could be potentially impacted by construction of a four-lane Interstate highway in any one of the four route corridors are as follows:

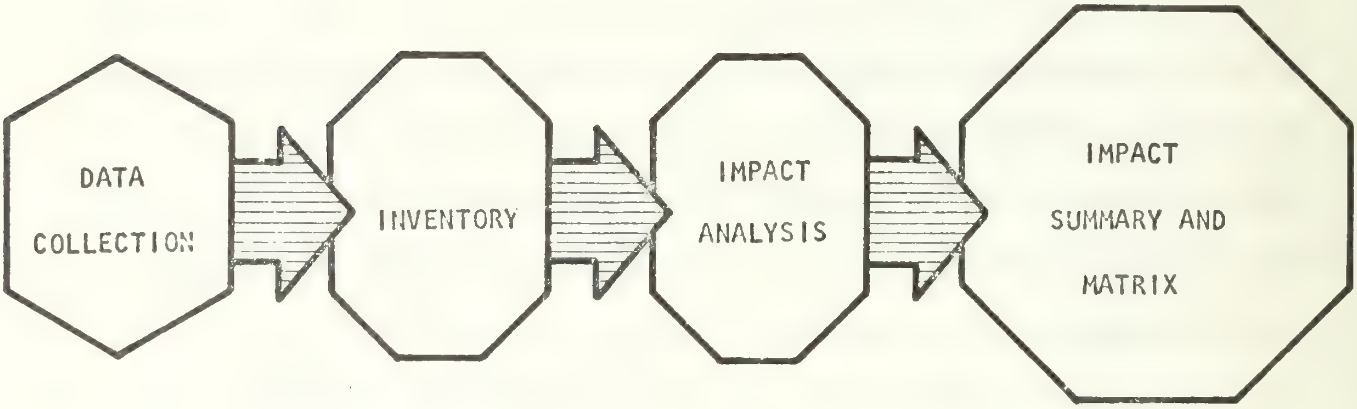
	Map No.
Man-Made Features	
History and Archaeology	1
Recreation	2
Natural Features	
Physiography	3
Slopes	3
Geology	4
Vegetation	5
Wildlife and Fisheries	6
Aesthetics	7

This study is concerned with determining the type and degree of impact that might occur to the above components through the construction of a four-lane Interstate highway. In considering the possible impact we are concerned with clearing limits, cuts and fills, drainage structures, channel changes, borrow areas, interchanges, and the adverse affect of a controlled access high-speed road corridor on the adjoining lands and activities.

Since the environment is the sum total of its parts, these parts must be isolated and potential impacts identified for each component in order to understand the total environmental impact which might occur. In order to do this, an inventory of the different components relative to the four corridors being studied was prepared. This inventory was compiled from existing maps and surveys, reports, aerial photos, discussions with numerous agencies and individuals, as well as field investigations, observations, and experience. A base map was prepared at a scale of one inch to the mile (1"=1 mi.) covering the entire study area. The information on each component, accumulated through the inventory process, was then plotted on a reproduction of the base map.

Upon completion of the inventory stage, critical areas of potential impact are discussed and identified for each factor. Each impact is then ranked or evaluated as to its relationship to the total environment for each of the four alternate road corridors. Impacts are rated as high, medium or low based on the amount of damage or detriment caused to that segment of the environment.

The impacts relative to each individual component are then combined and analyzed in total. An environmental impact summary or matrix in chart form was prepared to provide a visual comparative evaluation of the four corridors under consideration. No recommendation on any particular corridor was requested or made since the information resulting from this study is only one element of several used in making a final decision.



STUDY PROCEDURE

III. IMPACT BY TOPIC

PROCEDURE

The impact analysis procedure is based on the environmental matrix. A description is given of the topic's characteristics and relevance, together with the sources of data. The potential impacts are then identified and rated as high, medium, or low, with appropriate discussion of the variables which influence the rating. Each of the eight components is taken in turn. Impact made on that component by each of the four alternate routes is discussed and the rating is tabulated. It is later entered with the other components on the summary. The potential environmental impact for the Whitetail and Boulder Valley routes is analyzed and rated only on that portion which would require new construction since a large segment of each of these routes includes Interstate 90 extending east from Butte on which construction is complete.

MAN MADE FEATURES

HISTORY AND ARCHAEOLOGY - MAP NO. 1.

History - The area embraced by the four study corridors had a later starting history compared to many parts of Montana. It began to come into history with the opening of mining activities in 1862 and there are several stages represented in the surviving remains. Along with the mining came the development of transportation and communication facilities and there are several historic survivals from this field of history. Ranching history began with the coming of beef herds to feed the miners, but a stable ranching economy came to the region rather late and many of the ranch properties are too recent to qualify for protection under the Historic Preservation Act.

Approximately 24 historic sites lie within or closely adjacent to the four route corridors. At the present time none are classified as being of national significance, a few probably would be considered of state significance, but the majority are only of local significance. Appendix 1, the Historical and Archaeological Analysis, provides a fairly complete history of the study area, as well as a description of each site and its present significance and future potential, if any.

The Elkhorn State Historic Site lies roughly eight miles east and slightly north of the town of Boulder on Elkhorn Creek. It carries National Historic Landmark status and is one of the best mining exhibits in the state. Although not in the study area, and therefore not influenced by any of the proposed road corridors, it is a part of the historic resource of this general area.

Archaeology - Virtually all published source material on the archaeology of central Montana was examined by the consultant and conferences were held with several noted authorities in the field including Dr. D. Taylor of the University of Montana, Dr. Leslie Davis, Montana State University, and Mr. Stuart W. Conner of Billings. It was found that no significant recorded field work has been done in this region. Although there is evidence of long human occupancy in the surrounding region, this immediate area apparently was used for transient summer hunting campsites.

Examination of aerial photographs of the four corridors revealed no indication of major sites. The impact on archaeology is therefore considered minimal on all routes. However, it is recommended that routine salvage archaeological reconnaissance be made along the chosen route in the usual manner. The complete Historical and Archaeological report is contained in Appendix 1.

POTENTIAL IMPACT.

Basin Route. There are eighteen (18) identified historical sites in or adjacent to the Basin route corridor. Individually these sites are relatively unimportant, but in the aggregate they could have strong state significance. There are many well preserved historical remains in the general area surrounding Basin, but outside of the route corridor, which would still be accessible via the interchanges at Bernice, Basin and Galena Gulch.

Most of the identified historic sites on the Basin route are easily accessible from the present roadway. Construction of the Interstate would directly affect a number of these sites either by loss through construction activities or loss of ready access. However, since the sites are predominantly local in significance the potential impact is judged to be in the medium range.

Nez Perce Route. There are two identified mining sites on this route neither of which carry even local significance nor would they be affected by the construction of the Interstate. There is one other mining property of minor local significance. The Ironside mine, sometimes called the Shields-Ironside properties, has been worked very little and was a very low producer.

The Missouri River Power and Light Company constructed a power line up this canyon in 1901 and a corduroy road across the marshy Little Boulder Park area east of Nez Perce Pass had to be built to facilitate the power line construction. The potential impact is judged to be minimal or low.

Whitetail Route. There are no historically significant mining properties in this corridor. However, there is a degree of historical significance to the entire route and there are some historical sites involved related to the history of early transportation through the area. The main stage route from Helena, Montana to Corrinne, Utah roughly followed the county road from Whitehall to Boulder and for twenty years this was one of Montana's most important communication lines.

At the north end of the route is the site of the original Boulder Station on the stage route. There are two old ranch sites, the C.L. Dearborn Ranch and Black's Ranch, that may have served some function relative to the stage line operations. In addition, there are several surviving sets of ruts from this trail which have been identified. It is believed that as a historical entity the stage route could have both state and national significance and that much of it could be preserved with proper care in the location of the Interstate.

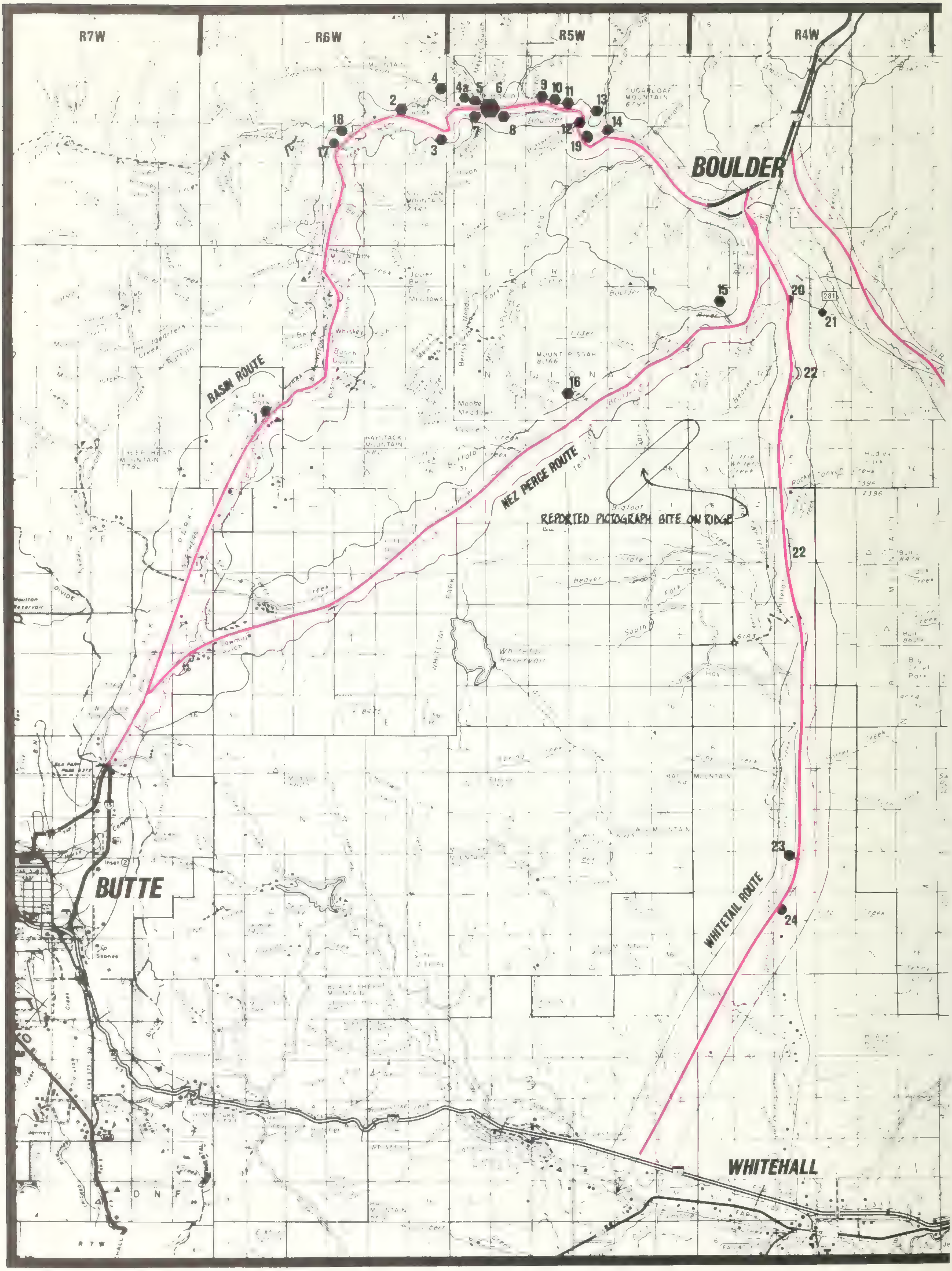
The potential impact is judged to be medium.

Boulder Valley Route. This route passes through a region in which the settlement did not begin until the 1890's. There are no sites of state or national significance and only one of local significance - the resort of Boulder Hot Springs which dates from 1883.

The potential impact is judged to be minimal or low.

POTENTIAL IMPACT SUMMARY

IMPACT KEY ● HIGH ◒ MEDIUM ○ LOW	BASIN ROUTE	NEZ PERCE ROUTE	WHITETAIL ROUTE	BOULDER VALLEY ROUTE
HISTORY and ARCHEOLOGY	◒	○	◒	○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BUTTE
WHITEHALL
BASIN ROUTE
NEZ PERCE ROUTE
WHITETAIL ROUTE
REPORTED PICTOGRAPH SITE ON RIDGE
SUGARLOAF MOUNTAIN
MOUNT PISGAH
HAYSTACK MOUNTAIN
RAT MOUNTAIN
Whitetail Reservoir
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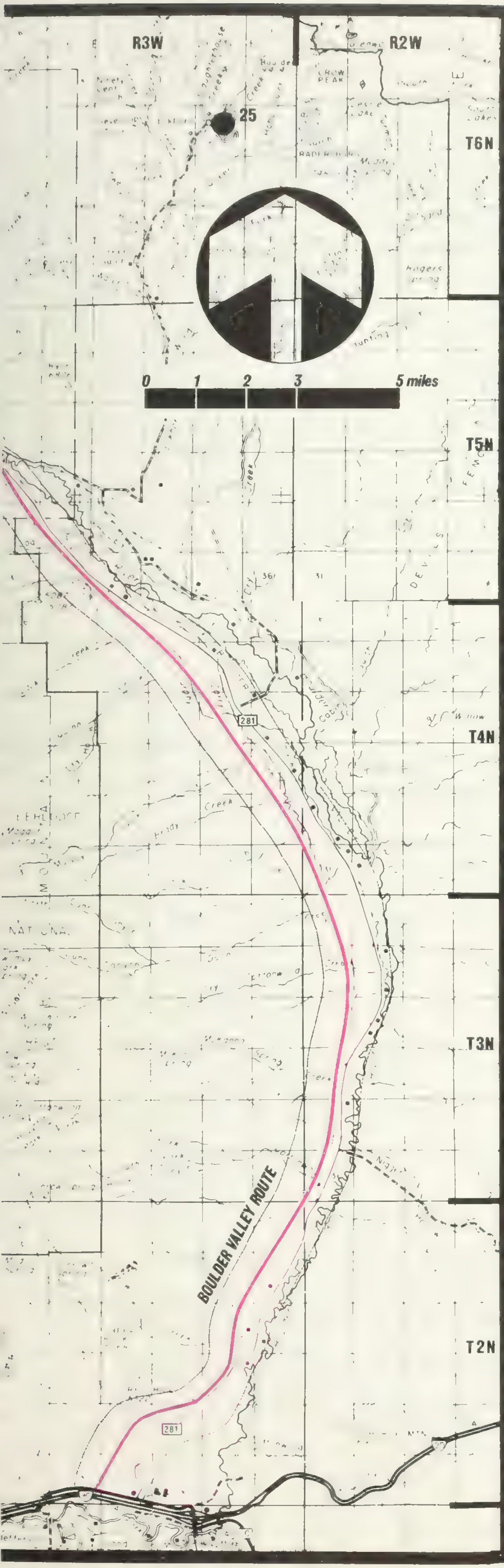


1 HISTORY and ARCHEOLOGY

⬢ MINING RELATED SITES*

1 ELK PARK ORE LOADING
2 INDIAN HEAD ROCK
3 BLUEBELL HEALTH MINE
4 BOULDER MINE
4a LOTTA MINE
5 EAST KATIE MINE
6 BASIN TOWNSITE
7 JIB MINE AND MILL COMPLEX
8 MERRY WIDOW MINE
9 EARTH ANGEL MINE
10 BASIN QUARTZ QUARRY
11 OBELISK MINE
12 RAILROAD TRESTLE
13 HIGH ORE MINE
14 HIGH ORE CREEK
15 NICKELODEON MINE
16 WILSON CREEK PLACIER

● OTHER HISTORIC SITES*

17 HISTORIC RANGER STATION
18 OLD STAGE STATION
19 OLD STAGE RUTS
20 BOULDER STAGE STATION
21 BOULDER HOT SPRINGS
22 STAGE RUTS (HELENA - CORRINNE UTAH)
23 C.L. DEARBORN RANCH 1871
24 BLACKS RANCH 1871
25 ELKHORN

*SEE APPENDIX 1 FOR DESCRIPTIONS OF EACH SITE

prepared by:
WIRTH ASSOCIATES
ENVIRONMENTAL PLANNING and DESIGN
BILLINGS MONTANA

RECREATION - MAP NO. 2

Description. Within the Butte, Helena, Three Forks region, the study area plays a considerable role in providing recreational resources. Both transient and local populations make use of the resources and facilities located in this area. Recreational activities include camping, picnicking, fishing, hunting, hiking, driving for pleasure, summer residences, and snowmobiling. As shown on Map No. 2, facilities for accommodating these pursuits are located throughout the study area but are concentrated mostly in the Basin and Nez Perce corridors. Because they pass through heavily forested and scenic terrain, it is only natural for recreational activity to take place here. The major portions of the Whitetail and Boulder Valley routes are located on open grass and range land where there are few recreational resources.

In studying the impact of the proposed Interstate on recreation, the following considerations were used as guidelines: 1) amount of direct impact on the physical facilities themselves; 2) impact on access to the facility; and 3) impact of noise, visibility and air pollution on facilities.

Recreation accommodation was also broken down into, 1) de jure or designated areas - those areas and facilities having political sanction and administered by a national, state, local or private agency; and 2) de facto or undesignated areas - unregulated use that has developed over a period of time in a particular area.

Information on recreation was supplied by the U.S. Forest Service, the Montana Fish and Game Department, the Montana Highway Department, the Bureau of Land Management, and by direct observation. Following is a discussion of the recreational resources and potential impact for each alternate route.

Basin Route.

Designated or de jure Use

Elk Park Campground - Located approximately 10.5 miles southwest of Basin on Route 91, it covers approximately eleven acres and contains eleven camping sites. According to Forest Service data, the area is filled to capacity on weekdays. Weekend use is predominantly by people from Butte and other local residents who stay two or three nights. Weekday use is predominantly by overnight transients.

The proposed Interstate route would take approximately two acres from the northerly side of the campground which would eliminate the present means of access, and the U.S. Forest Service plans to abandon this site and provide replacement facilities at a new location more remote from the roadway if this alternate route is selected. Consideration was given to a joint rest area - campground facility, but it was felt that this might change the present predominantly weekend use to an overnight type campground.

Even though this campground will be replaced with equal or superior facilities, the impact on this particular area was judged to be high.

Bison Creek Picnic Area - Located approximately eight miles southwest of Basin, it covers approximately 2.4 acres and is located in a hollow below a curve in Route 91. According to Forest Service data, the fifteen picnic units were used by 700 persons in 1967 primarily by families living in the vicinity. Transient use is not high due to the close proximity of Shamrock Campground and the difficulty of access. The proposed Interstate route would completely eliminate this picnic area. Impact is therefore rated high.

Shamrock Campground - Located approximately 7.2 miles southwest of Basin on Route 91, the campground covers about thirteen acres, contains seven camping units and fourteen picnic sites, and according to Forest Service data, it was used by 3,600 people in 1967. Use of the campground is similar to the Elk Park Campground, predominantly by local people on weekends and holidays, and tourists on weekdays.

The proposed Interstate route would take about 2.7 acres off the east side of the campground and eliminate present access. Replacement facilities are proposed at another location as for Elk Park Campground, but the impact on this site is rated high.

Recreation Residences - Five cabins are located within the impact corridor. One at the Bison Creek Campground lies near the proposed right-of-way and may lose its present access. Three sites in the Homesite Creek area and one at the High Ore area would lose their existing access. Relocation is the only feasible alternative for the latter residence as access to and from the proposed Interstate would be almost impossible to obtain. New access roads to the others may not be feasible. The potential on recreation residences is rated as medium.

Other de jure Outdoor Recreation - A snowmobile track and dog training grounds are located in the vicinity of some now defunct fish ponds. The proposed highway project will not directly affect these areas and access can be provided by a frontage road from the Woodville Interchange. The potential impact is judged to be low.

Undesignated or de facto Use

Sport Fishing - The initial impact on water quality would be severe. Over six miles of channel on Bison Creek and the Boulder River would be disturbed or altered by the proposed construction. Excessive turbidity will occur during construction and for some time after until slopes and banks again stabilize. At the present time these streams are accessible from almost any point of the road where the shoulder is wide enough to park a vehicle. The Interstate will limit access to six interchanges at Woodville, Trask, Bernice, Basin, Galena Gulch, (or High Ore) and Boulder, plus several miles of access and frontage roads. The potential impact on access to sports fishing is judged to be high.

Hunting, Hiking and Other Back Country Uses - This type of activity generally takes place well back from the road corridor. The Interstate will constitute a barrier between the two sides of the valley except at designated locations. Parking along the present U.S. 91 will also be eliminated. However, the potential overall impact on these activities is judged to be low.

Other de facto use including historic explorations, rock hounding, driving for pleasure, sightseeing, and other activities could be reduced. Access to certain areas such as High Ore Creek, Basin and Bernice will remain. At the present time spontaneous recreation does occur in many areas along the road and its adjacent landscape; the proposed Interstate would reduce such opportunities. The potential is judged to be medium.

Summary

The overall potential impact of the Basin route on recreation is judged to be high.

Nez Perce Route.

Designated or de jure Use

Elder Creek Campground - Located approximately six miles south of Boulder at the junction of Elder Creek and the Little Boulder River, the campground covers approximately two acres, is administered by the U.S. Forest Service, and contains seven picnic tables, fireplaces, garbage cans and other supporting facilities. Access is provided by a low standard, narrow truck-trail type road which limits the amount of use. The campground is designed as a picnic and parking area and is used almost entirely by local residents. Forest Service data shows use by 400 people in 1967. The proposed Interstate route would eliminate the site entirely. Potential impact is judged to be high.

BLM Recreation Site - This site, 60 acres in extent, lies two and one-half miles south of Boulder along the Little Boulder River and access is provided by a Forest Service road. The site is used by the Boulder River School and Hospital under a special Land Use Permit from the Bureau of Land Management. It provides a place for picnics, hiking, and general relaxation. It appears that access and part of this site would be usurped by the proposed Interstate. Noise from vehicles climbing the grade would be detrimental to recreational use even if the area could be retained. Potential impact is rated as high.

Recreational Residences - Two cabins near the Elder Creek Campground would be isolated and would have to be relocated. Cabin sites located in the Nez Perce residential site would have access from U.S. 91 via the Trask County Road and would not be affected. There are eight similar cabin sites in the Sawmill Gulch area, and several others along the proposed corridor. Noise would be a factor as well as possible need for relocations. The potential impact is judged to be medium.

Undesignated or de facto Use

Sports Fishing - The Little Boulder River and Nez Perce Creek are the only two streams involved. Nez Perce Creek is a small stream and provides little if any fishing. The Little Boulder River provides fishing for rainbow, cutthroat, brown and brook trout. Construction of the Interstate would have a very severe impact on fishing in this stream and also on the fish population. The potential impact is judged to be high.

Hiking, Hunting, and Snowmobiling - This route would open up access to areas not now available through the Moose Creek Interchange. There would be some impact on the roadless area because all types of vehicles would then have access to previously unused areas. The potential impact is judged to be low.

Other de facto Use - There are signs of de facto use along the present Forest Service road, small scale mining, rock hounding and other such activities. The proposed highway would eliminate such use but the potential impact is judged to be medium.

Summary

The potential impact of the Nez Perce Route on existing recreational facilities is severe, but they are relatively minor in character and extent in relation to the study area as a whole, and overall potential impact is therefore judged to be medium.

Whitetail Route. There are no designated campgrounds, picnic areas, cabin sites or other de jure uses along this corridor. Recreation along the Whitetail route is totally de facto and includes the following:

Hunting - The hunting of big game and game birds is the major recreational activity in this area. The construction of the Interstate would affect the movement of game and will bisect both the antelope range at the south end of the valley and the elk range at the northern end of the valley. It is difficult to assess what impact this might have on hunting. The impact on wildlife is covered elsewhere. The Interstate will impede the east/west movement of hunters during the hunting season, but the potential impact is judged to be low.

Sport Fishing - There is little fisheries use or potential on this route and the potential impact is rated as low.

Other de facto Use - Most activity is carried on primarily in the upland forested areas where numerous jeep and foot trails are found and at the southern end where snowmobiling is popular with the local residents. The top of Whitetail Pass receives the heaviest de facto use. It serves as a scenic point and informal picnic ground, as well as a point of beginning and ending for foot and jeep trails. It is possible to avoid and preserve this site but current use would not warrant access from the proposed Interstate. The potential impact is rated low.

Summary.

Because of the character of the terrain, primarily open grass covered slopes, the existing use and future recreational potential along this route is very limited. The potential impact of the Interstate is therefore judged to be low.

Boulder Valley Route. There is little or no existing recreational use or future potential along this route for the same reasons enumerated for the Whitetail route. There are no designated campgrounds or picnic areas, and no recreational residences. De facto recreational use in the Boulder Valley includes the following:

Sport Fishing - The Boulder River runs through the valley and it supports a good population of native trout. Current fishermen access is limited to bridges on public roads and private lands where access is permitted. The tentative alignment proposed for the Interstate would not be in close proximity to the river and its impact on the stream or its use for fishing is judged to be low.

Hunting - Big game hunting, antelope on the south and mule deer on the north, is carried on in the valley in season. The Interstate corridor will impede the east/west movement of hunters but potential impact is judged to be low.

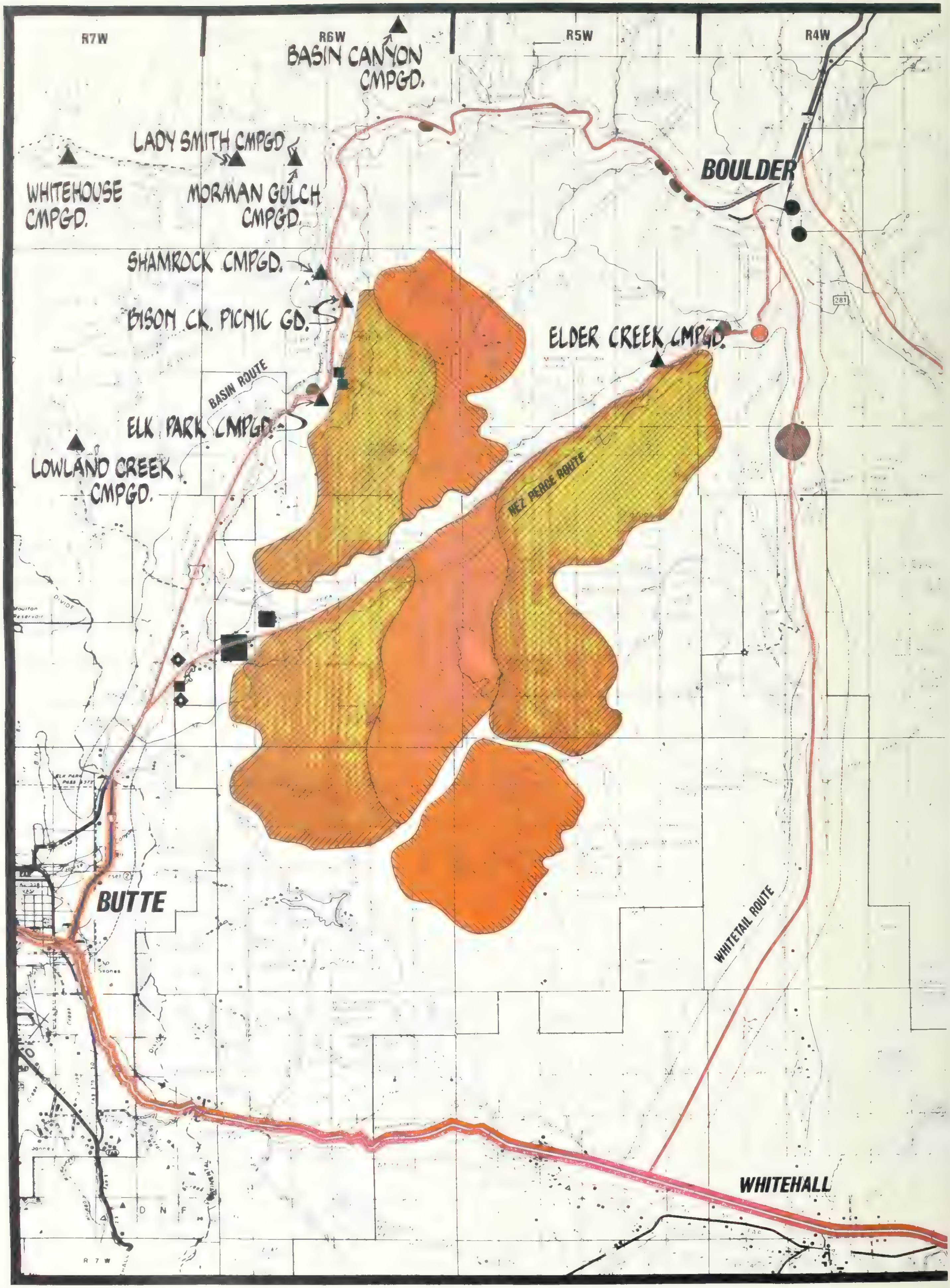
Other de facto Use - No significant use areas were noted along this route. There are potential areas along the bottomlands outside the corridor, but access would continue to be available from the existing FAS Route 281 which would be retained as a frontage or access road for the entire valley. The potential impact is judged to be low.

Summary.

The overall impact of the Boulder Valley route on recreation is judged to be low.

POTENTIAL IMPACT SUMMARY

IMPACT KEY ● HIGH ◒ MEDIUM ○ LOW	BASIN ROUTE	NEZ PERCE ROUTE	WHITETAIL ROUTE	BOULDER VALLEY ROUTE
RECREATION	●	◒	○	○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LADY SMITH CMPGD
WHITEHOUSE CMPGD.
MORMAN GULCH CMPGD.
SHAMROCK CMPGD.
BISON CK. PICNIC GD.
BOULDER
281
ELDER CREEK CMPGD.
BASIN ROUTE
ELK PARK CMPGD.
LOWLAND CREEK CMPGD.
NEZ PERCE ROUTE
Moulton Reservoir
DIVIDE
BUTTE
WHITETAIL ROUTE
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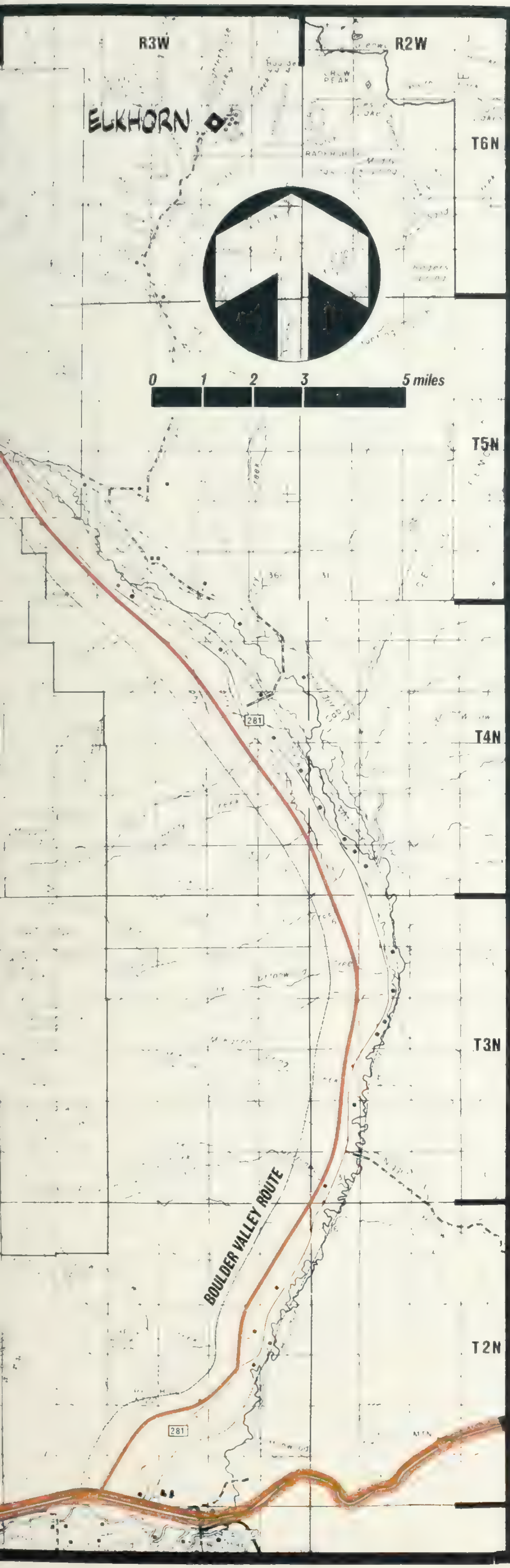


2 RECREATION

▲ CAMPGROUND AND PICNIC AREAS

● LOCAL PARKS

● B.L.M. RECREATION AREAS

■ RECREATIONAL RESIDENCES /CABIN SITES

◇ OTHER RECREATION AREAS

▨ U.S.F.S. ROADLESS AREAS

▨ U.S.F.S. ESSENTIALLY ROADLESS

● DE FACTO USE AREAS

prepared by:
WIRTH ASSOCIATES
ENVIRONMENTAL PLANNING and DESIGN
BILLINGS MONTANA

NATURAL FEATURES

PHYSIOGRAPHY - MAP NO. 3.

Physiography is a term applied to the character and shape of natural land forms - mountains, rolling hills, plains, valleys and the rivers and streams which constantly change and modify them.

The study area encompasses roughly 600 square miles of exceedingly varied terrain. It includes precipitous forested mountains, broad gently rolling grassy valleys, steep narrow canyons, and level grass covered upland parks. The Boulder River and its tributaries drain most of the area except the Whitetail Valley, which is drained by Little Whitetail Creek and its tributaries. Elevations vary from 4,300 feet at the southern end of the Boulder Valley to Haystack Mountain at 8,821 feet. The Continental Divide crosses at Elk Park Pass about two and one-half miles northeast of Butte at elevation 6,368, and at Homestake Pass about seven miles southeast of Butte at elevation 6,375.

The physiographic map portrays topographically the general character of the land forms in each corridor. The contour interval is 200 feet and alternate contours have been emphasized to improve the readability. The rugged character of the Nez Perce corridor, portions of the Basin corridor and the portions of the Whitetail and Boulder Valley routes along the existing Interstate southeast of Butte are readily discernible. The potential impact is evaluated by a close examination of the physiographic features in each corridor and then estimating the impact which would be made upon these land forms by construction of a four-lane Interstate highway. Generally speaking, the severity of impact is directly related to the angle or gradient of the cross slopes and the roughness of the topography being crossed.

Basin Route. This route begins at the East Butte Interchange near Butte. Beginning at Butte, the first five miles climb steeply to Elk Park Pass and from here head in a northeasterly direction for nine miles across the center of Elk Park to the head of Bison Creek Canyon.

Elk Park is a flat upland grass covered park averaging about two miles in width and surrounded by mountains. It slopes gradually from the Pass at elevation 6,368 to the head of the canyon at elevation 6,230. The potential impact on this section is low.

The next six miles from the head of the canyon to Shamrock Campground are through Bison Canyon, a narrow winding canyon with steep heavily forested side slopes. Bison Creek runs along the bottom of the canyon. The canyon drops over 500 feet on this section from elevation 6,230 to elevation 5,722. The steep side hill topography in this section will require heavy cuts and fills and over two miles of channel changes on Bison Creek. The potential impact is considered to be high.

A short distance below Shamrock Campground the canyon opens up, the floor of the canyon widens out and the side slopes become less precipitous. This condition prevails for the remaining three miles of Bison Canyon and for three miles into the Boulder River Canyon. The terrain on this section is much easier and the proposed use of independent alignment will help to reduce the impact. The canyon gradient also begins to lessen on this section with a drop from 5,722 feet at Shamrock Campground to 5,480 feet at the end of this section for a total drop of 242 feet. About a mile of channel changes would be required on this section. There are short stretches in this five mile section where the impact would probably be severe, but overall it is considered in the medium range.

For the next mile and one-half the canyon again becomes very narrow with steep forested slopes. Heavy cuts and fills will again be required and all but 900 feet of the Boulder River would require a new channel through this section. The potential impact is considered to be high.

At this point the canyon again opens up, the steep side slopes recede, and the floor of the canyon becomes wide and grass covered. This continues for the next two miles to the quartz quarry east of the town of Basin. The canyon floor continues to drop at an almost constant gradient of 50 feet to the mile. There are 2,125 feet of channel changes involved in this two mile section. In this section the road would be lying on relatively flat grass covered side slopes and the impact is considered to be low.

Beginning at the quarry the canyon becomes exceedingly narrow and steep sided for the next two miles. This tight situation is further complicated by the Burlington-Northern Railroad so that a river, a railroad, and a four-lane highway must somehow be fitted into this narrow twisting canyon. As a result the road is forced onto the side hill slopes resulting in some heavy cuts and fills. There are 2,475 feet of channel changes in this section. The potential impact is judged to be high.

For the next mile to the beginning of Galena Gulch the canyon opens up, but again the road is forced onto the relatively steep side slopes on the north side of the canyon with the resulting heavy impact. About 800 feet of channel change is required on this section. The potential impact is judged to be high.

For the next two-plus miles, to the end of the project, the canyon is relatively narrow but there is sufficient room on the canyon bottom to accommodate the road. The railroad also begins climbing out of the canyon at Galena Gulch leaving the canyon floor free for the Interstate. The major impact in this section is on the Boulder River which is crossed and recrossed and manipulated through most of this section. There are 5,600 feet of channel change in this two mile section. However, since much of the river has been changed in previous years by construction of the railroad and the present highway the potential impact on this section is considered to be medium.

In view of the fact that there are approximately ten miles of highly impacted area, and about eight miles in the medium range, plus almost six and one-half miles of channel changes, the overall potential impact on the physiography of the Basin corridor is judged to be high.

Nez Perce Route. The Nez Perce route begins at Butte at the same point as the Basin route and climbs to Elk Park Pass. From here the next four miles cross Elk Park to the foot of Sawmill Gulch at elevation 6,320. Elk Park has been previously described as a relatively level grass covered area and the potential impact on this section is judged to be low.

From this point the route ascends for five miles along Sawmill Gulch and Nez Perce Creek to Nez Perce Pass at elevation 7,420. The route lies above the stream on heavily forested very steep side slopes. Heavy side hill cuts and fills will be required and the potential impact is judged to be high.

The next mile lies across Little Boulder Park, a level area, grass covered with scattered groups of trees. The potential impact would be minor and is judged to be low.

At the north end of Little Boulder Park at elevation 7,320, the route enters the canyon of the Little Boulder River, descending for ten and one-half miles to elevation 4,960. This is a very narrow steep sided canyon, heavily wooded with numerous small side drainages. The route lies primarily on the north slopes of the canyon but crosses to the south occasionally and is on the canyon floor for part of the distance. A major portion of this stream alignment will be altered and will be severely impacted. In addition, almost this entire section will be on steep side hill requiring heavy cuts and fills. The potential impact is judged to be high.

The final two and one-half miles from the mouth of the Little Boulder River Canyon to the town of Boulder is open rolling, grass covered terrain, cut by dry washes and minor drainages. Only moderate cuts and fills would be required on this section and the potential impact is judged to be medium.

The potential impact on the physiographic features of the Nez Perce corridor is judged to be high.

Whitetail Route. This route also begins at the East Butte Interchange. It follows existing 4-lane Interstate Highway 90 for about 17 miles crossing the Continental Divide at Homestake Pass at elevation 6,375 to an interchange site about two miles east of the existing Pipestone Interchange. From here this route continues almost due north on new alignment which would require new highway construction for 26½ miles to the town of Boulder. For 17 miles after leaving I-90, it traverses a relatively broad, rolling grass covered valley which slopes gradually from approximately elevation 5,300 on the north end to approximately 4,500 on the southern end and is drained by Little Whitetail Creek. The route then crosses Whitetail Pass at elevation 5,730, a low mountainous area of small open grassy parks and scattered areas of forest cover, and then continues on to the town of Boulder.

Beginning at I-90 the first seven miles of the Whitetail Pass route traverses rolling, open, grass covered hills cut up by minor drainages and numerous dry washes. Moderate to occasionally heavy cuts and fills would be required and the potential impact is judged to be medium.

The next ten miles to the head of the valley mostly parallels or is directly over the existing Federal Aid Secondary road 399. This again, is open, flat, grass covered rangeland with negligible cross slopes. Cuts and fills would be minimal and the potential impact is judged to be low.

The next six miles are across Whitetail Pass. This section is characterized by semi-open grassy parks, forested slopes, and a rather cut up drainage pattern. There may be short stretches where cuts and fills could be kept to a minimum, but most of this section would require relatively heavy cuts and fills and the potential impact is judged to be high.

From the bottom of the Pass the next two miles leading toward Boulder is open relatively flat, grass covered rangeland. Minimal cuts and fills would be required and the potential impact is judged to be low.

The last mile leading to the connection with the present construction on Interstate 15 is over open terrain cut by many drainages. Moderate to heavy cuts and fills will be required and the potential impact is judged to be in the medium range.

The open rolling character of the portion of the Whitetail Pass corridor after it departs from I-90 lends itself to highway construction with minimal impact. Even though approximately six miles, across Whitetail Pass, are rated high, the overall potential impact on the physiographic features through the 26 mile length which would require new construction in the Whitetail Pass corridor are judged to be medium.

Boulder Valley Route. This corridor also begins at the East Butte Interchange and it follows the completed 4-lane Interstate Highway 90 over the Continental Divide through Homestake Pass for about 29 miles to an interchange site 11 miles east of Whitehall. From here the portion of this route which would involve new 4-lane highway construction swings in a north-east-north-northwest arc some 31 miles up Boulder Valley to a connection with existing I-15 just north of the town of Boulder. The valley slopes from elevation 5,000 at the northern end to elevation 4,300 on the south and it is drained by the Boulder River and its tributaries. It is realatively broad, grass covered, and gently rolling with minimal cross slopes except in certain areas covered below. The corridor is well above the flood plain and only crosses the Boulder River once.

From Interstate 90 the first five miles crosses rather broken terrain, cut by several drainages and numerous dry washes. The grade undulates on this section going from elevation 4,375 at Interstate 90 to 4,600 and back down to elevation 4,450. Cuts and fills would be moderate to heavy on this section and the potential impact is judged to be in the medium range.

The next five miles are on flat to gently rolling open terrain with minimal cross slopes. Cuts and fills should be minor in extent and the potential impact on this section is judged to be low.

The next two and one-half miles crosses a section of terrain that is badly cut up with numerous dry washes and a few drainages. Cuts and fills in this section are likely to be moderate to heavy and the potential impact is judged to be in the medium range.

The next eleven miles are on relatively open, flat to rolling terrain with minimal cross slopes. Cuts and fills on this section should be minimal and the potential impact is judged to be low.

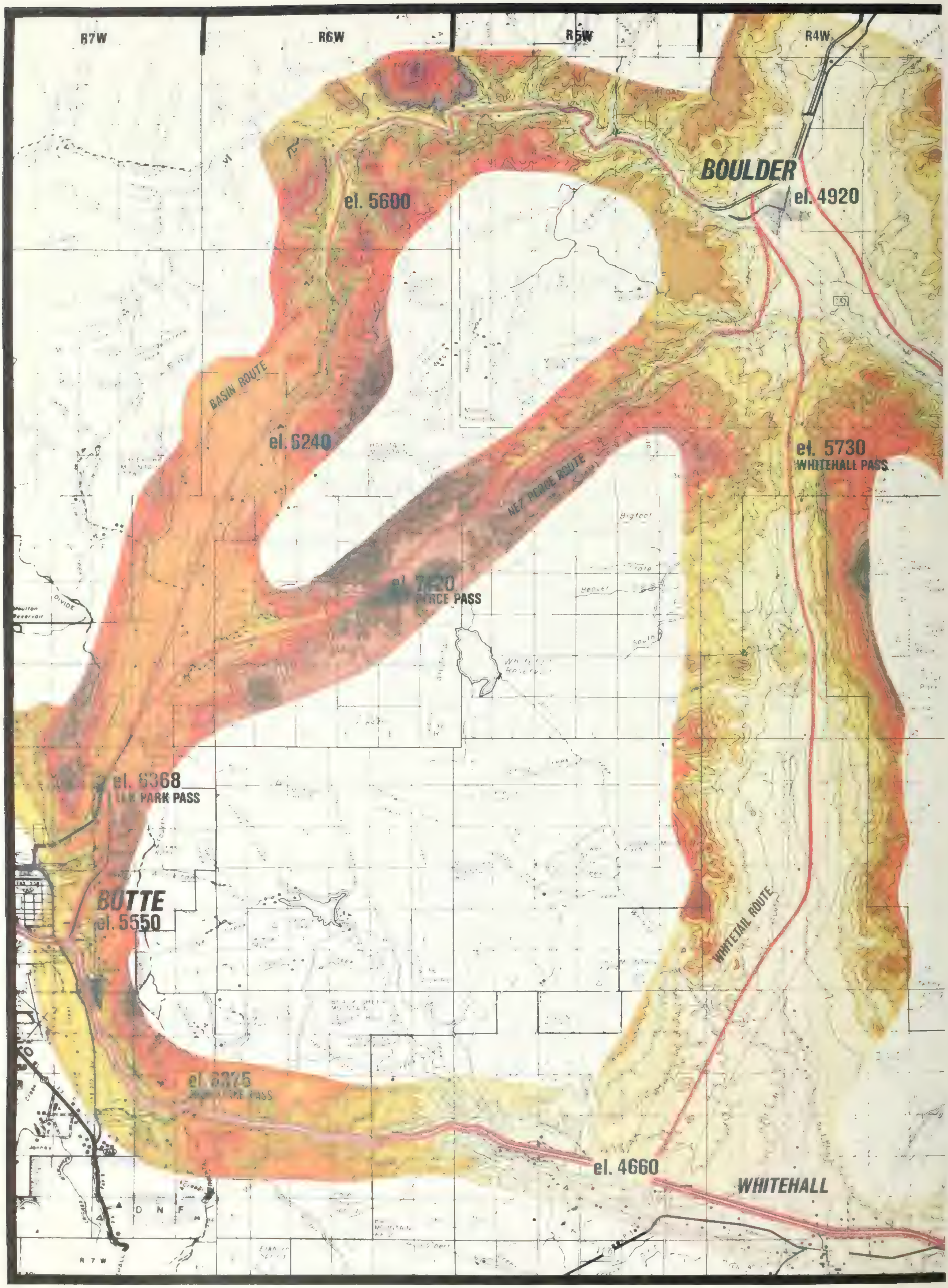
The next five miles includes a crossing of the Boulder River. The terrain is a grass covered undulating bench above the flood plain with moderate cross slopes. Moderate to heavy cuts and fills would be required and the potential impact is judged to be in the medium range.

The last two and one-half miles crosses Boulder Valley in a northwesterly direction and joins I-15 north of the town. The terrain is open, almost flat, range and hay lands, and cuts and fills should be minimal. The potential impact is judged to be low.

The open rolling character of this Interstate corridor also lends itself to highway construction with minimal impact. The potential impact on the physiographic features of this corridor through the construction of an Interstate highway is considered to be low.

POTENTIAL IMPACT SUMMARY

IMPACT KEY ● HIGH ◒ MEDIUM ○ LOW	BASIN ROUTE	NEZ PERCE ROUTE	WHITETAIL ROUTE	BOULDER VALLEY ROUTE
PHYSIOGRAPHY	●	●	◒	○


R7W
R6W
R5W
R4W
BOULDER
el. 4920
el. 5600
BASIN ROUTE
el. 6240
NEZ PERCE ROUTE
el. 7120
PERCE PASS
el. 5730
WHITEHALL PASS
DIVIDE
el. 6368
ELK PARK PASS
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WHITETAIL ROUTE
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HOMESTAKE PASS
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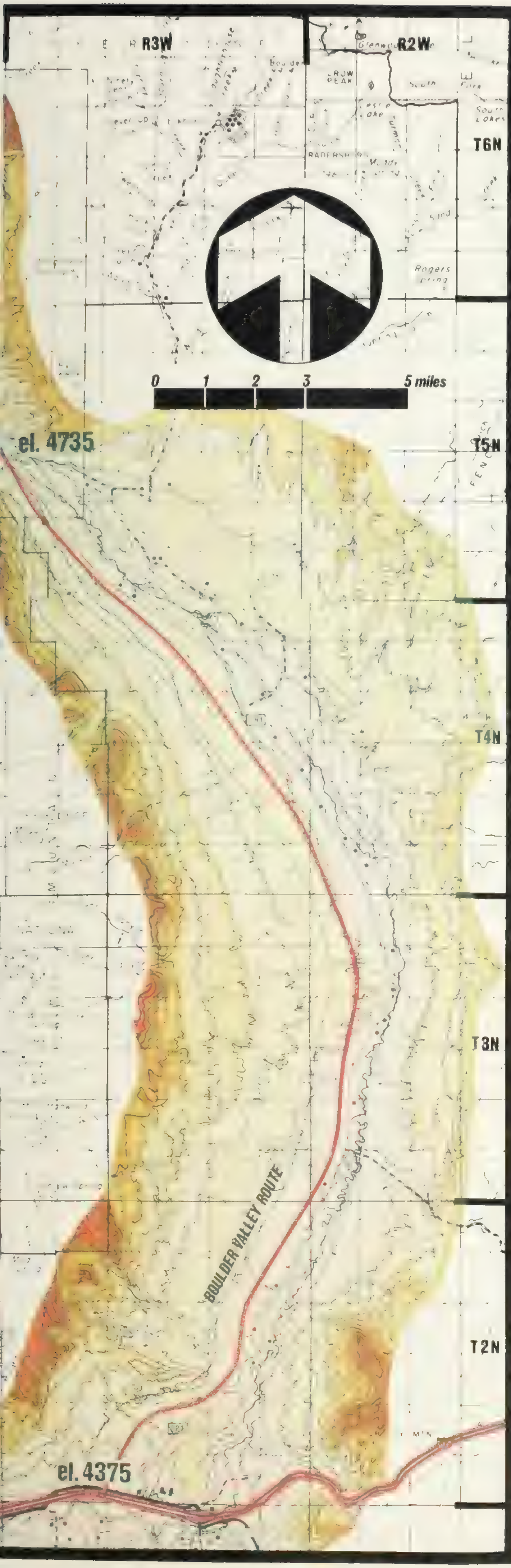
WHITEHALL
D N F
R 7 W



③ PHYSIOGRAPHY

CONTOUR INTERVAL = 200 FT.

ELEVATION RANGE

🟫 78—8200′
🟫 74—7800′
🟥 70—7400′
🟥 66—7000′
🟧 62—6600′
🟧 58—6200′
🟨 54—5800′
🟨 50—5400′
⬜ 46—5000′
⬜ 42—4600′

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WIRTH ASSOCIATES
ENVIRONMENTAL PLANNING and DESIGN
BILLINGS MONTANA

GEOLOGY - MAP NO. 4

When considering the impact of a proposed four-lane Interstate highway upon geology the main concern is with problem areas, unique geologic formations. Based on the study done by the State Geologist of the Montana Department of Highways, no unique problem areas were found along any of the routes. However, the character of the Basin and Nez Perce routes may be distinguished from the Whitetail and Boulder Valley routes because of major geologic differences. These differences make it possible to conclude relative degrees of impact for each route. Map No. 4 illustrates the geologic formations which occur along each route based on the State Geologist's field survey. Descriptions of each rock type are listed at the end of this section.

Following are general descriptions of the geologic situation along the proposed corridors:

Basin and Nez Perce Routes. The valley bottoms through which the proposed routes pass are filled with relatively shallow deposits of sediment derived locally from the Boulder Batholith. Symbols Qal, Quaternary alluvial deposits, and Qkb, colluvial outwash deposits, on Map 4 illustrate these areas. The clastic sediments of these valleys are chiefly composed of silty sands with gradations ranging from feldspar derived clays on the fine fraction to boulders on the large end. These areas will require special attention with regard to maximum allowable steepness for back slopes. This is basically an engineering problem; however, the size of back slope and related features have a definite relationship to the impact on the natural environment. Considering these factors it was judged that the Basin and Nez Perce routes would have a medium potential impact upon geology.

Whitetail and Boulder Valley Routes. The major portions of both these routes lie within tertiary age clastic sediments. The Northern portion of the Whitetail route, which is composed of intrusive and extrusive rock units, is similar in character to the Nez Perce and Basin routes. The southern portion of the Boulder Valley route may encounter argillaceous pre-Cambrian rock units; recent construction in this area utilized a 1½:1 cut slope design. The tertiary sediments in the center portion of the Boulder Valley route may require treating of swelling subgrade soils, as evidenced in existing State Route 281; however, the extent of this is thought to be small. The construction for these routes should present few problems and the overall impact on the natural geology is judged to be *low* for Boulder Valley, and *medium* for Whitetail.

POTENTIAL IMPACT SUMMARY

IMPACT KEY ● HIGH ◒ MEDIUM ○ LOW	BASIN ROUTE	NEZ PERCE ROUTE	WHITETAIL ROUTE	BOULDER VALLEY ROUTE
GEOLOGY	◒	◒	◒	○

DESCRIPTIVE LEGEND FOR MAP NO. 4

Kv - Cretaceous volcanics undifferentiated; predominant composition - quartz latite and andesite.

Penb - Pre-Cambrian belt rocks of the North Boulder Group composed of argillaceous metamorphics.

Ps - Lower Paleozoic Rocks - undifferentiated sandstones and limestones.

Qal - Quaternary alluvial deposits of sands, silts, and gravels.

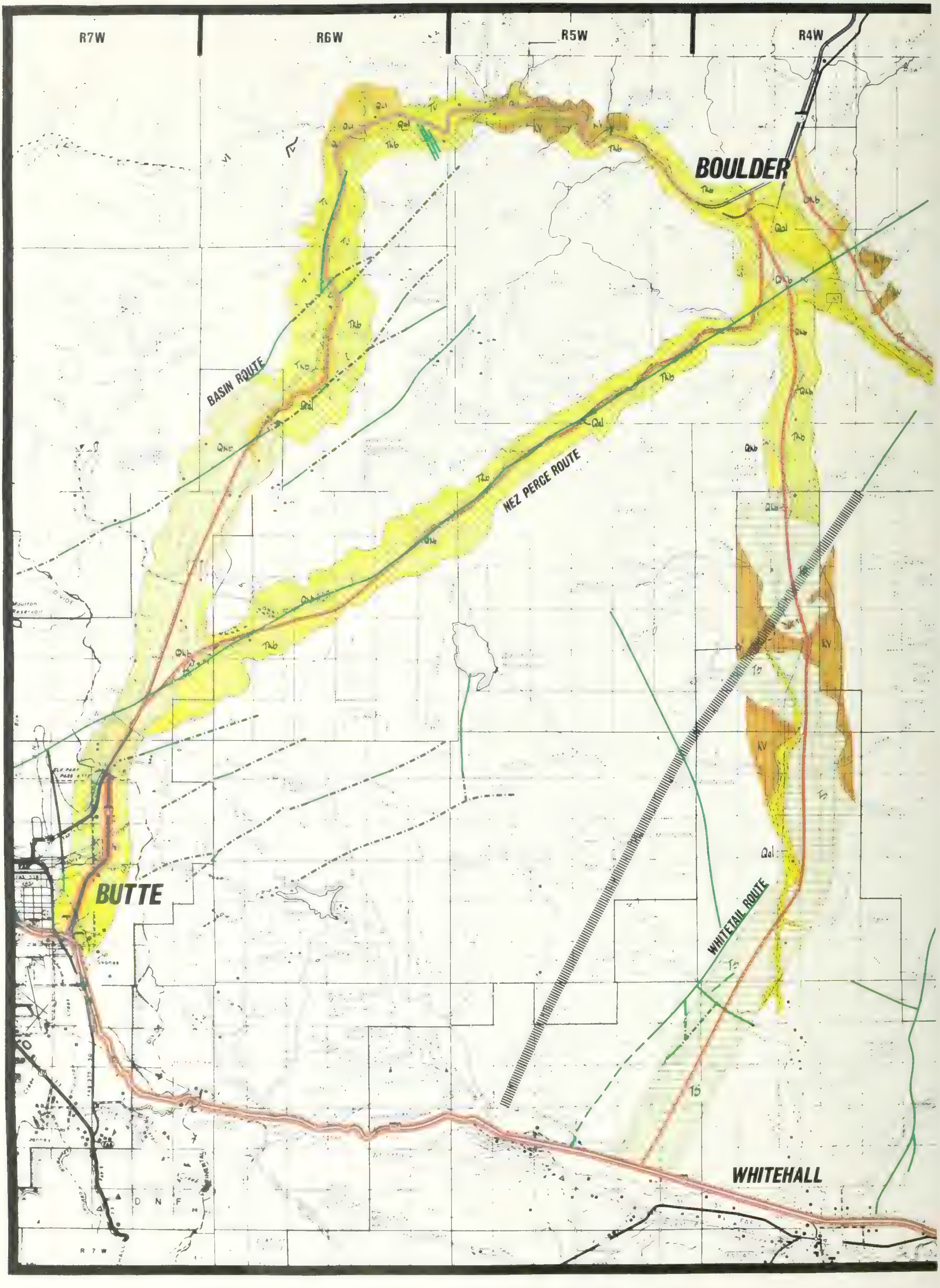
Qcl - Quaternary colluvial deposits consisting of sands, silts, rocks and gravel; poorly sorted materials.

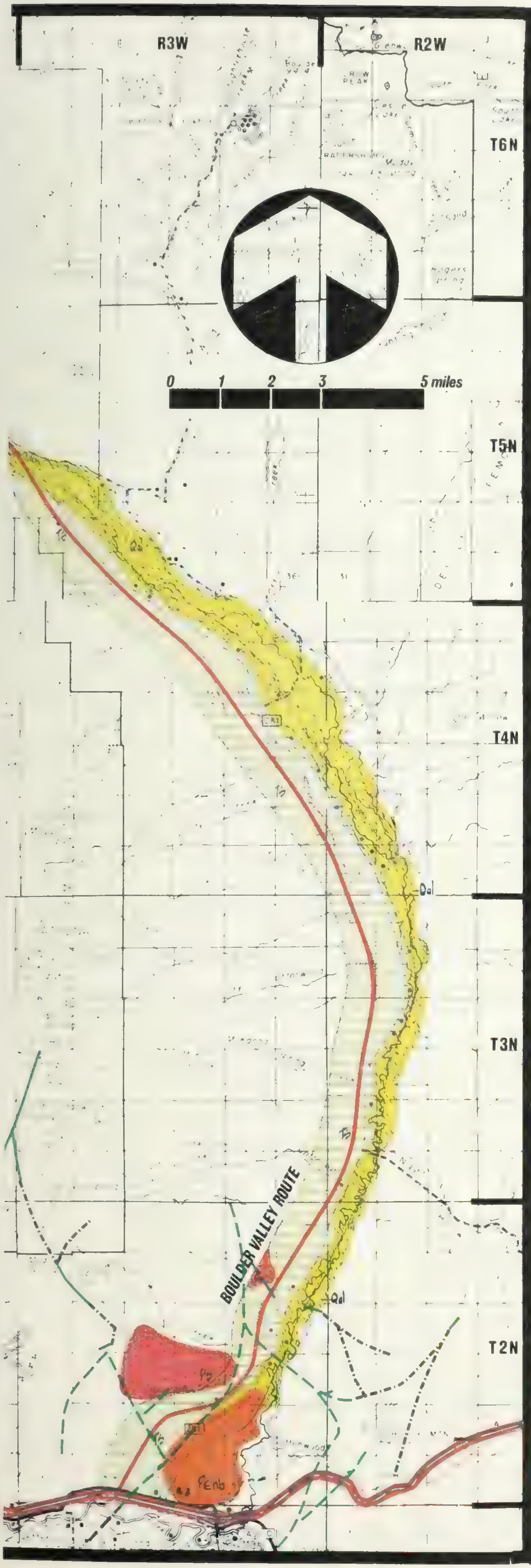
Qkb - Colluvial outwash deposits derived from the adjacent Boulder Batholith.

Tkb - Tertiary rocks (intrusive) of the Boulder Batholith, basically of quartz monzonite composition.

Ts - Tertiary sediments composed of alluvial deposits of sands, silts and gravels, and colluvial deposits derived from cretaceous and tertiary igneous rocks.

Tv - Tertiary volcanics undifferentiated; predominant composition - quartz latite.


R7W
R6W
R5W
R4W
BOULDER
BASIN ROUTE
NEZ PERCE ROUTE
WHITETAIL ROUTE
BUTTE
WHITEHALL
Qal
Tkb
Kv
Tv
Ts
Qkb
15
R 7 W
D N F



4 GEOLOGY

Kv	CRETACEOUS VOLCANICS
pЄnb	PRE-CAMBRIAN BELT ROCKS
Pz	LOWER PALEOZOIC ROCKS
Qal	QUATERNARY ALLUVIAL DEP.
Qcl	QUATERNARY COLLUVIAL DEP.
Qkb	COLLUVIAL OUTWASH DEP.
Tkb	TERTIARY ROCKS
Ts	TERTIARY SEDIMENTS
Tv	TERTIARY VOLCANICS
-·-·-	KNOWN FAULT
—	PROBABLE FAULT
- - -	INFERRED FAULT
||||||||||	INFERRED LINEAMENT OF WEAKNESS

prepared by:

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VEGETATION - MAP NO. 5

There are three basic vegetative types which occur on all four alternates: forest cover (mostly coniferous); shrub and grasslands; and riparian related cover (water, stream bank or flood plain). The coniferous cover is composed of lodgepole pine, ponderosa pine, spruce, and Douglas fire; the riparian related cover includes aspen, willow, dogwood, elder, rushes and sedges and other water related material; native grasses such as the grammas, blue bunch wheatgrass, downy brome, and others, together with the native shrubs, constitute the grassland cover.

The impact on vegetation was evaluated on the time required for the indigenous vegetative cover to become re-established. Areas of coniferous forest are the most significant, require the longest period to recover, and carry the highest impact potential, followed by the riparian related cover and finally sage and grasslands.

The initial impact in the construction prism (top of cut to toe of fill) is always total. Since detailed plans, profiles, and cross sections are not available, an assumption was made that the ground surface will be disturbed for an average width of 200 feet. This provided a basis for a comparative evaluation. The acreage of disturbed areas was then computed according to the type of cover as indicated on the vegetative type map.

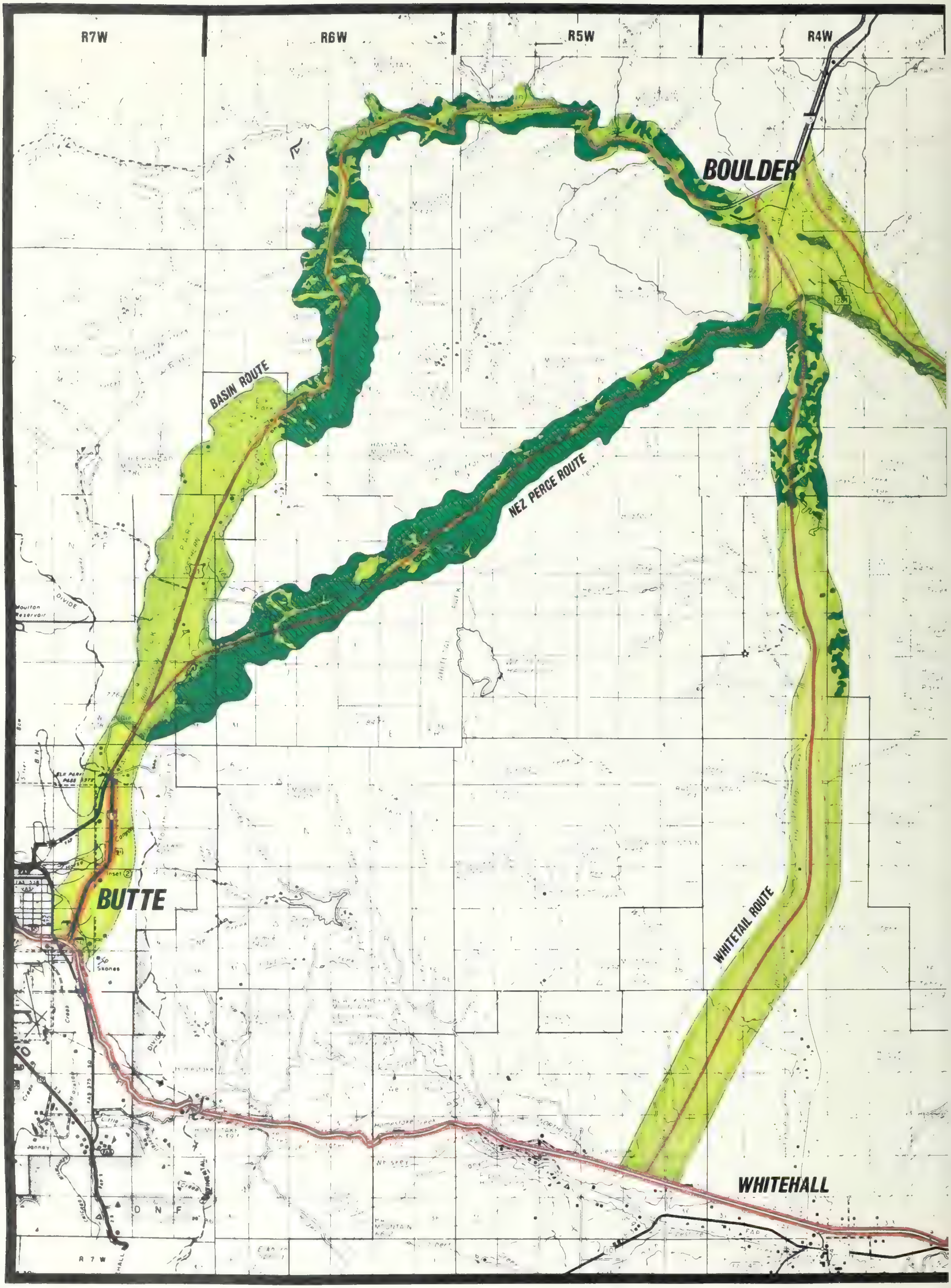
The following chart illustrates graphically the results of these computations and evaluations:

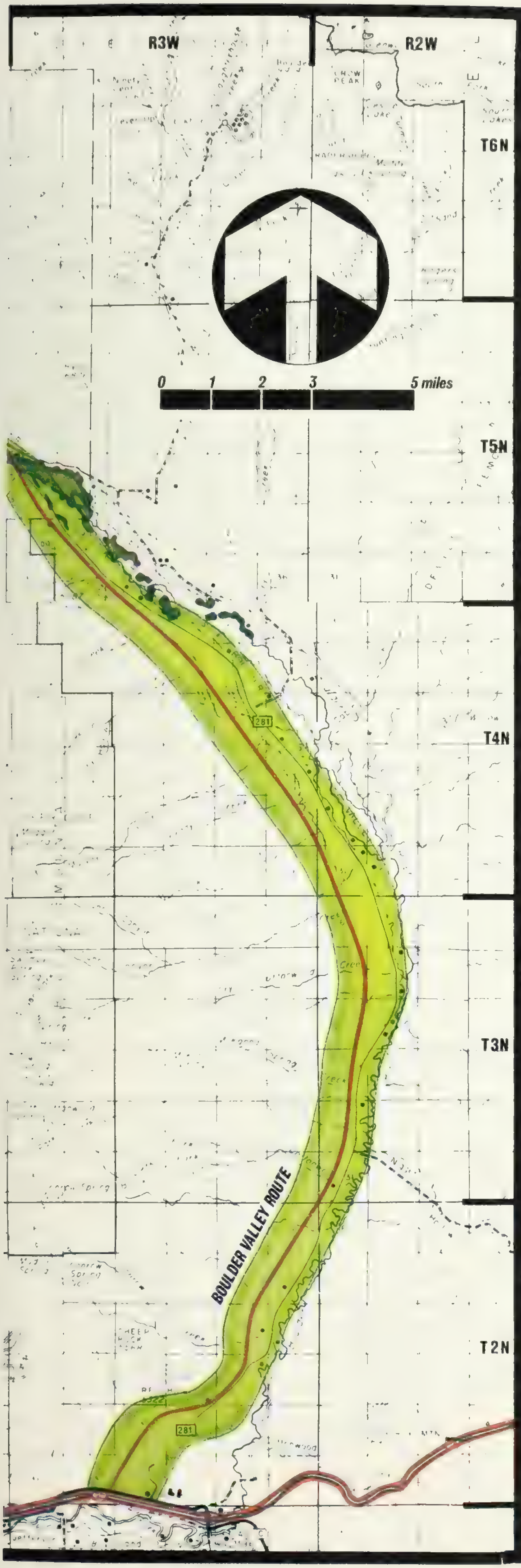
	Forest	Riparian	Grasslands
Basin Route	23%	16%	61%
Nez Perce Route	60%	- 0 -	40%
Whitetail Route	17%	3%	80%
Boulder Valley Route	-0-	2%	98%

It is obvious from the chart that an Interstate highway constructed in the Nez Perce corridor would have the highest impact on the vegetative cover since 60% of this route is in forest cover. The Basin and the Whitetail routes would have the next highest impact, followed by the Boulder Valley route which has the lowest impact of the four alternates. The vegetation map graphically illustrates the impact on vegetation as revealed by the chart.

POTENTIAL IMPACT SUMMARY

IMPACT KEY ● HIGH ◒ MEDIUM ○ LOW	BASIN ROUTE	NEZ PERCE ROUTE	WHITETAIL ROUTE	BOULDER VALLEY ROUTE
VEGETATION	◒	●	◒	○


R7W
R6W
R5W
R4W
BOULDER
BASIN ROUTE
NEZ PERCE ROUTE
WHITETAIL ROUTE
BUTTE
WHITEHALL
Moulton Reservoir
DIVIDE
Inset 2
Skones
Janney
R 7 W



5 VEGETATION

🟩 CONIFEROUS FOREST

🟩 RIPARIAN WOODLAND

🟩 SAGE, GRASS AND OPEN LANDS

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WILDLIFE AND FISHERIES - MAP NO. 6

Description

Wildlife - Information on wildlife used in this study was furnished by the Montana Fish and Game Department and the U.S. Forest Service. The full report by the Montana Fish and Game Department is contained in the Appendix. The study area contains both big game animals and a variety of other forms of wildlife. Big game animals include mule deer, elk, moose, antelope, and black bear. In addition, there are mountain grouse, rabbits, squirrels, coyotes, members of the cat family, furbearers, several kinds of rodents including prairie dogs, some types of water fowl, songbirds, and golden eagles. The Wildlife and Fisheries Map shows the various summer and winter ranges of the big game animals, significant migration routes, and other pertinent wildlife information.

The potential impact on wildlife and fisheries is under one heading, but they are discussed individually on each of the four routes. A description of the wildlife in each corridor follows, together with the potential impact resulting from the construction of an Interstate highway.

The Basin Route.

Mule deer are the predominant species of big game throughout the Boulder-Elk Park highway corridor, but elk, moose, and black bear also frequent the corridor. Generally, these animals remain at higher elevations during the summer months and utilize the lower south facing slopes along Bison Creek and the Boulder River as wintering areas. Deer and elk use of bottom areas and unroaded side greenages immediately adjacent to the Boulder River has been noted as late as the last week in May, indicating that for a minimum of six months the bottomlands in and along the corridor are used by big game. Browse transects and observations near Bernice and Basin support the contention that deer use browse on south facing slopes near the Boulder River.

In addition to big game other wildlife such as mountain grouse, rabbits, coyotes, squirrels, and others previously listed utilize the vegetative cover which now exists along the Boulder River and Bison Creek. The present highway through this area was built in the early 1930's so there has been ample time for disturbed areas to be revegetated. Both streams have abundant growths of willows and other vegetation which provides excellent food and cover for wildlife in the area. Two golden eagles' nests have also been located within this corridor and are shown on the accompanying map.

Potential Impact - The major effect on wildlife resulting from the construction of an Interstate highway through this corridor will be the destruction of habitat from construction activities, the loss of area taken for the highway lanes, access roads and interchanges, the land between the lanes, and the land required for frontage roads. While some vegetation may be preserved where split alignments occur, this will be essentially unavailable for most wildlife use. Much of this vegetation is of varying importance to sustain wildlife during severe winter periods. Small game, fur-bearers, and non-game species of wildlife will also suffer from the loss of this habitat.

Road kills of deer, and occasionally elk, are common in narrow winding canyons. There will be an increased hazard to deer and other wildlife due to the wider expanse of road to cross, plus faster highway travel. Better visibility will help to alleviate this problem.

There is not a large seasonal migration of game animals crossing the present two-lane highway. Since elk and deer winter on south slopes in both sides of the Boulder River and Bison Creek, localized movements occur. A fenced four-lane highway may interfere with these movements.

Correspondence with game departments in neighboring states indicates that generally speaking Interstates do not form impassible blocks for elk migration. In addition, there are some indications that individual elk have become accustomed to the high sound levels associated with highway travel. However, since elk normally avoid human contact there would be generally adverse effects on the elk population.

There will also be a loss of access to hunting areas along this route. Some areas now readily accessible will become very difficult to reach. However, the significance of this loss on wildlife populations per se is unknown.

Although the impact of the Interstate construction on wildlife in this area is substantial, it is not severe and the potential impact is judged to be in the medium range.

The Nez Perce Route.

The major portion of this route is located in the summer range of big game animals and is inhabited by all species of wildlife mentioned in the Basin route section. The area normally receives heavy snowfall and migrating species of animals move to stream bottoms or open slopes at lower elevations. Winter use by moose takes place along the Little Boulder River bottoms and significant use by elk and deer occurs along the south facing slopes. Elk use the upper Little Boulder River Drainage in the spring for calving and also as a summer range.

Because this area receives little vehicular traffic during the summer months, and essentially none during the winter months, all forms of wildlife now enjoy a virtually pristine environment.

Potential Impact - Since this proposed route is located through an area which is primarily summer range for wildlife, the loss of land area used for construction and the loss of browse vegetation is not as critical as the loss of wintering range. Game animals are normally dispersed in summer over a wider range and do not congregate in specific key areas. This route encroaches on moose range along its entire length but the precise impact on the moose population is contingent upon the exact location of the route. Potential losses include browse types in Sawmill Gulch at the head of Nez Perce Creek and the Little Boulder River. The overall potential impact is negative and could be significant.

Some impact could be anticipated on the spring elk calving grounds on the upper Little Boulder River Drainage. Seclusion is an essential element of calving areas and the proposed route would probably eliminate such use.

There is little seasonal migration of game animals across this route except perhaps in the lower two miles of the Little Boulder River Drainage. The major portion of the route follows a generally northeast/southwest direction. The area to the south of the route is north slope and heavily timbered. There is thus little reason for migration from the south facing slopes on the north side of the proposed route to this timbered area. Some movement occurs on a localized basis between feeding areas on south slopes to cover on north slopes.

Generally speaking, the area through which this route is proposed is essentially undeveloped and thus provides a less disturbed habitat for elk and other wildlife. An Interstate highway through this area would disrupt these generally favorable conditions. The construction of an Interstate highway through this corridor is judged to have a severe or high potential impact on the wildlife in the area.

The Whitetail Route.

Mule deer, elk, moose, black bear, and antelope are the principal species of big game found in the area of this alternate route. Other wildlife and species of game birds which reside in the area are generally the same as those which are found along the Basin route.

Wildlife habitat on this route is similar to that found in the Basin and Nez Perce routes for the approximately four and one-half miles across Whitetail Pass. The habitat then changes to open grassland which accounts for the presence of antelope in the area. The antelope herd generally utilizes the area in the south portion of the valley. Other kinds of wildlife, such as prairie dogs, other types of rodents, and birds which are adapted to an open grassland type of habitat are also present.

Both elk and deer winter on either side of the valley, as well as on Bull Mountain on the east side of the valley. Wintering deer have also been observed in the lower reaches of Beaver Creek about four miles from Boulder, and some use is also made of the Whitetail Pass area for wintering purposes during mild winters. Elk migrate from both the east and west sides of the valley via Whitetail Pass and the Pass probably serves as an escape route for Elk during the hunting season. This may be significant for certain time periods for this reason as well as for normal seasonal migration.

Potential Impact - Mule deer wintering along the foothills in the northernmost sections of this proposed route would be affected by the loss of wintering area. In addition, there would be an increased hazard of road kills of deer during winter and spring.

There is a definite fall, winter, spring movement of elk across Whitetail Pass. In severe winters this movement is essentially complete by late fall and occurs again in the spring. In mild winters elk probably move locally throughout the winter. There seems to be a lack of information on the numbers of elk that migrate. If only small numbers migrate across the Pass seasonally, and these elk can and do cross the present road, the Interstate would not have a significant impact on elk herd size. On the other hand, if a large number of animals normally migrate, summer and winter ranges on both sides of this alternate route may not be adequate if the migration routes are blocked. This would necessarily result in a reduction of herd numbers.

Most of the Whitetail Pass route is located through open grassland. With exception of the effects on the antelope herd which resides in the southern end of the valley, the effect on wildlife through this area would be less significant than in the Basin or Nez Perce routes because the habitat is more homogenous.

The antelope range would be divided by the Interstate, very possibly separating winter and summer game range. This is important because antelope cannot pass through or over standard design Interstate fences and they also tend to avoid crossing highways. These problems could possibly be alleviated by other fence design or underpasses as local conditions dictate - that is, sheep proof fences may not be required. Some adverse effect may be reduced by changing the final location of the highway in this section of the valley.

Other game, non-game and furbearers would be affected on this route much as described under the Basin route section. However, since the grassland habitat type generally does not support the quantity and diversity of wildlife species found on stream bottom habitat types, then the loss would be less.

The potential impact on wildlife created by the construction of an Interstate highway through this corridor is considered to be moderate or medium impact.

The Boulder Valley Route.

The habitat associated with a highway corridor extending from Boulder to Interstate 90 near Cardwell, is primarily dry, open grassland. Foothill terrain is encountered for a short distance immediately south from Boulder.

Antelope are the primary big game species associated with the area throughout the Boulder Valley corridor. They are more prevalent through the southern part of the valley, with the major population being east of the existing FAS Route 281. If the new highway is located on or west of the existing route, little opportunity exists to encounter mule deer habitat except for the area immediately south from Boulder. Other kinds of wildlife, including various rodents and birds adapted to the grassland habitat, are also present.

Potential Impact - The major effect on wildlife would be destruction of habitat that results from actual construction, the loss of area taken for highway lanes, access roads and the land between the lanes. An improved high speed road of any kind increases opportunity for vehicle contact with wildlife. Antelope rarely cross Interstate fences and very likely the existing fenced section of the FAS route is sufficient to prevent their crossing freely even at the present time.

Because of the dry grassland habitat lacking capacity to support a large quantity and variety of wildlife, the Boulder Valley route would have much less impact on wildlife resources than would either the Basin route, the Nez Perce route or the Whitetail route. The net loss in terms of wildlife resource would be considerably less than in any of the other three alternatives. The potential impact is judged to be low.

POTENTIAL IMPACT SUMMARY

IMPACT KEY ● HIGH ◒ MEDIUM ○ LOW	BASIN ROUTE	NEZ PERCE ROUTE	WHITETAIL ROUTE	BOULDER VALLEY ROUTE
WILDLIFE	◒	●	◒	○

Fisheries.

The study area contains four streams which support varying amounts of fishing: Boulder River, Bison Creek, Little Boulder River, and Little Whitetail Creek. In addition, there are numerous small tributaries such as the Nez Perce and Boulder Creeks which serve as spawning and nursery streams. All of the streams have wild fish populations of rainbow, brook, brown and cutthroat trout, as well as whitefish. Catchable size hatchery rainbow trout are stocked in Bison Creek and Boulder River to augment naturally reproduced fish.

In 1968, the Montana Fish and Game Department, in order to obtain information for making estimates of the fishing pressure on various streams in this area, issued a questionnaire to fishermen covering all types of licenses. The results were tabulated in man days of fishing per year, with the fishing year extending from May through September. A total of 7,470 man days of fishing were recorded for the year and tabulated as follows:

	Man Days of Use
Boulder River from Basin east and south to Interstate 90	5,000
Bison Creek from Elk Park to Basin	1,000
Little Boulder River	1,250
Little Whitetail Creek	220

A description of existing conditions and an analysis of the potential impact for each alternate is given below.

Basin Route.

The Boulder River and Bison Creek are the main streams which would be affected by this project. Most of the tributaries contain similar fish populations and some would be affected by road crossings. These streams are both easily accessible for fishing and are open almost in their entirety for public fishing and use.

The physical fish habitat and water quality of these streams have been degraded by past stream alterations, mining and other activities of man. Past disturbances of both streams have reduced the potential for maximum fish populations from levels normally expected in mountain streams of this type. For example, water quality data collected in 1971 indicate that drainage from some mined areas now pollute some tributaries and the Boulder River to levels which inhibit fish food production, reduce fish growth, reduce spawning success, and in general create less than optimum conditions for aquatic life.

Some metals from abandoned mined drainage are present in the main Boulder River in amounts which have been reported to cause avoidance reactions to migratory fish, thus blocking existing or potential spawning runs from downstream. These areas are also essentially devoid of resident populations of trout.

Channel alterations from road and railroad construction which have occurred in the past also resulted in reducing the maximum potential for trout populations. Vegetation has recovered over the past several years and has probably alleviated to a minor degree some of the adverse effects of channel straightening by providing overhanging cover.

Potential Environmental Impact.

Fishing in the Boulder River at the present time is limited due to past neglect by developers in protecting the physical stream habitat and water quality. The most serious effect on the fishery in both Bison Creek and the Boulder River will be the added adverse impact on both of these factors, plus the loss of channel length. Even though great care is taken in planning and construction a serious amount of unavoidable damage will occur.

The effect on water quality during the construction period would be primarily from sediment, both in the suspended and deposited state. Even with every precaution, channel changes cannot be made without severe sedimentation and the resultant probable loss of aquatic insects, and, depending on the degree and duration of sedimentation, the loss of fish. These losses may be in the form of direct mortalities, indirect mortalities, or movement from the area. Considering the extent of required channel changes on this route it is assumed that the degree and duration of sedimentation will be severe. The effects on aquatic organisms will also be severe.

With the several channel changes and shortened total channel length, stream hydraulics will be radically altered. Increased erosion and change of channel following construction may result from this change in hydraulics unless extensive bank stabilization measures are taken. However, this often results in an artificial, and less productive stream. The loss of existing vegetation, particularly that which furnishes fish cover, would further limit the potential for fish populations. Over-head cover in streams the size of Bison Creek and the Boulder River is of paramount importance for maintaining successful fish populations and fishing.

A part of the proposed low grade access road which would also be used occasionally for driving cattle from Boulder to Bernice, is located immediately along-side the river as at Mile 158. Physical trampling by stock could destroy streamside vegetation in this area, with a loss of cover for fish, loss of root systems which stabilize undercut banks, and the destruction of stream banks unless prevented by bank protection barriers or fencing.

On the Boulder River there will be a net loss of approximately 800 feet of channel length resulting from channel changes necessitated by construction of the Interstate. This loss is considered moderate potential adverse environmental impact as a result of the reduced length. The Montana Fish and Game Commission is charged with providing an alternative plan or recommendation to the highway construction agency which will eliminate or diminish the adverse effect of construction or hydraulic projects. This is normally accomplished by meander construction, development of fishing access areas or other mitigative measures designed to equalize loss with benefits.

The overall potential impact on fisheries which would result from the construction of an Interstate highway on the Basin route is judged to be high.

The Nez Perce Route.

Two streams are involved in this alternate route, the Little Boulder River and Nez Perce Creek, both of which are essentially in a pristine state with the exception of some possible minor effects of past road construction and mining on the Little Boulder. The Little Boulder provides fishing for rainbow, cutthroat, brown, and brook trout in various sections of the stream. Nez Perce Creek is a small stream and serves only as a nursery stream for small trout at the present time.

Potential Impact

The proposed Nez Perce route essentially follows the course of the Little Boulder River. The stream is small; therefore, the fisheries potential is less than that of the Boulder River-Bison Creek complex. Nevertheless, channel realignment, stream bank cover loss, and water quality degradation caused by construction of this route would be significant. Comments relating to sediment pollution, channel straightening, the loss of existing vegetation, etc., made in the Basin route section apply to the Little Boulder River also, but to a lesser degree because of the lower inherent fishing potential.

Nez Perce Creek, a small stream, will also be adversely affected in much the same manner as the Little Boulder. There is no fishing in this stream but it does serve as a nursery stream for small trout and there is no doubt that this function would be severely impacted by construction of the proposed route.

The potential impact on fisheries which would result from the construction of an Interstate highway on the Nez Perce route is judged to be high.

The Whitetail Route.

Two streams are involved on the Whitetail Pass Route, the Beaver and Little Whitetail Creeks. Beaver Creek, tributary to the Little Boulder River, is a small stream and provides little or no fishing, although it probably serves as a spawning and nursery stream for small trout which may eventually migrate to the Boulder River.

Little Whitetail Creek on the south side of Whitetail Pass contains brook, rainbow, cutthroat, and brown trout, but is not considered a fishery of any great importance. There are some tributary streams to be crossed which contain small trout and have limited fishing use. The entire stream system in this area is essentially free from adverse physical effects from man's past activities, with the exception of some irrigation runoff.

Potential Impact.

There appears to be little fisheries use or potential in the streams within this corridor so there will essentially be no fishery impact. Fish passage problems and loss of nursery areas may occur, but since tributary crossings would be at right angles this would be deemed insignificant in the light of available information on this route. The potential impact on fisheries which would result from the construction of an Interstate highway on the Whitetail route is judged to be low.

The Boulder Valley Route.

The Boulder River is the main stream flowing through this area and this section of the river supports a good population of wild trout. Brown trout is the dominant species, with rainbow trout, mountain whitefish, and brook trout also present. The Boulder River flows through an agricultural valley and intensive use of the immediate flood plain has adversely affected game fish habitat. However, the stream still provides a significant fishery and this can be improved with the application of flood plain management. Fish habitat in this portion of the Boulder River may also be adversely effected by the physical and chemical problems that exist upstream, from the town of Boulder.

Potential Impact.

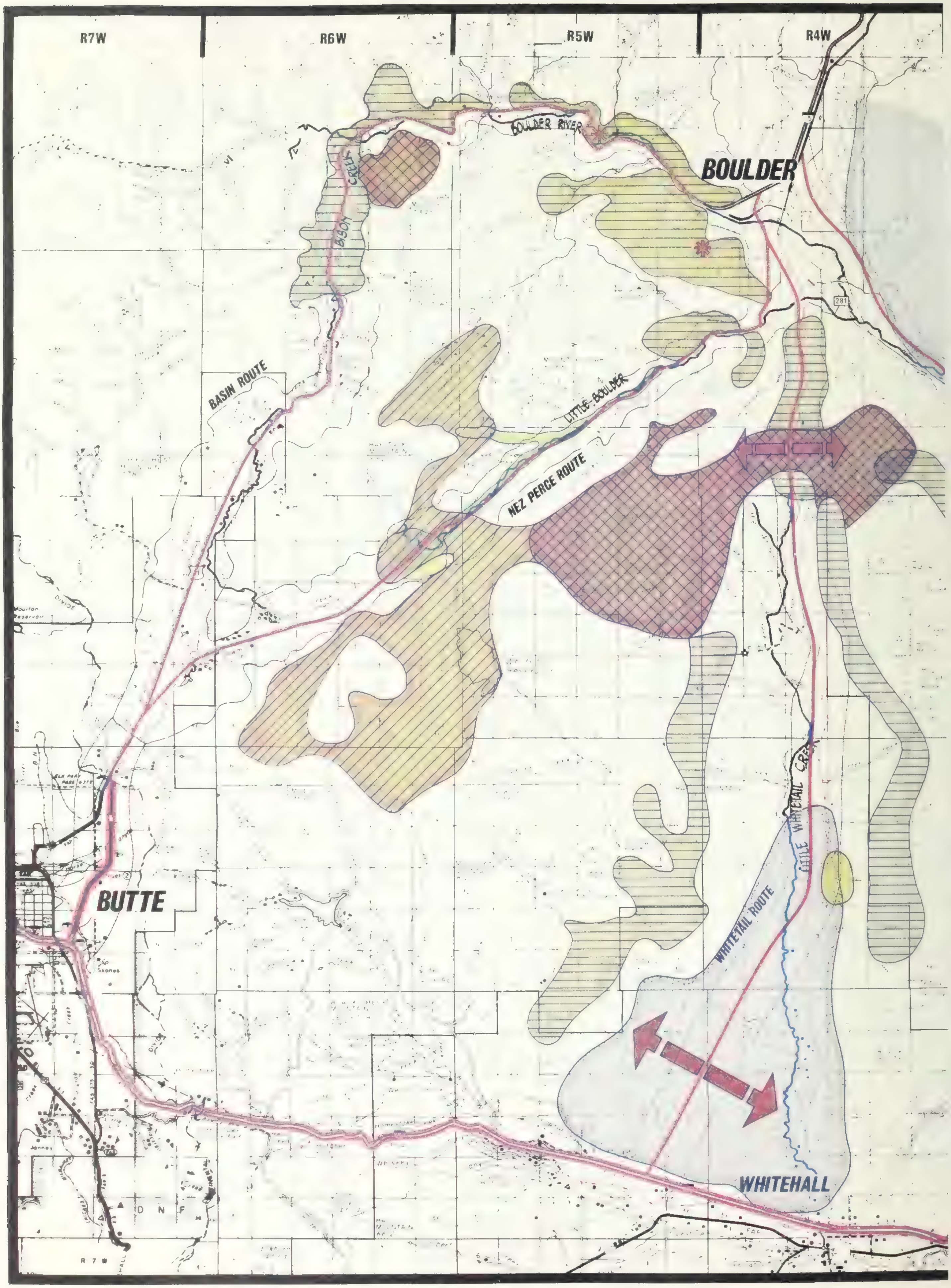
The Boulder Valley is relatively wide and the Interstate route would not be in close proximity to the stream. One river crossing would occur in the area immediately south of the Little Boulder, but mitigative measures could resolve this problem.

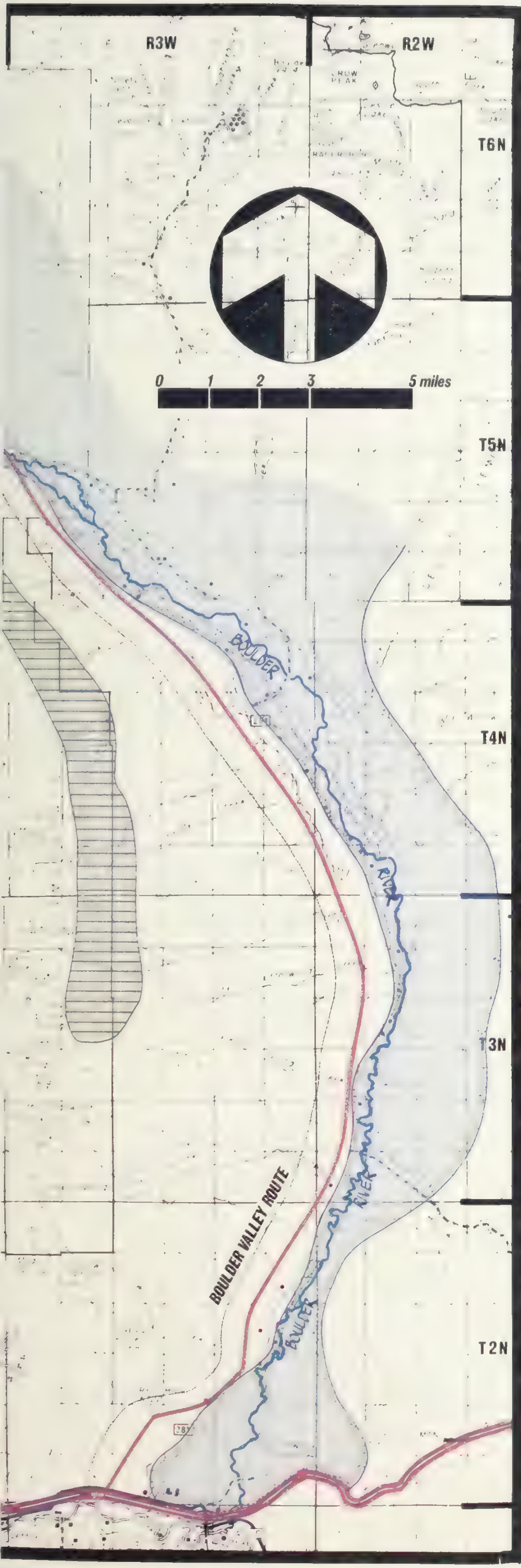
Since the alignment of the Interstate route is not in close proximity to the Boulder River, it would have little adverse effect on the fishery resources. Influence on fishery values would be comparable to that of the Whitehall route and less than the impact on the Nez Perce or Basin routes.

The potential impact on fisheries which would result from the construction of an Interstate highway on the Boulder Valley route is judged to be low.

POTENTIAL IMPACT SUMMARY

IMPACT KEY ● HIGH ◒ MEDIUM ○ LOW	BASIN ROUTE	NEZ PERCE ROUTE	WHITETAIL ROUTE	BOULDER VALLEY ROUTE
FISHERIES	●	●	○	○


R7W
R6W
R5W
R4W
BOULDER RIVER
BOULDER
BISON CREEK
281
BASIN ROUTE
LITTLE BOULDER
NEZ PERCE ROUTE
DIVIDE
Moulton Reservoir
ELK PARK PASS
BUTTE
WHITETAIL CREEK
LITTLE WHITETAIL CREEK
WHITETAIL ROUTE
WHITEHALL
D N F
R 7 W



⑥ WILDLIFE and FISHERIES

- ▤ ELK AND DEER KEY WINTER RANGE
- ▩ SPRING AND FALL ELK CONCENTRATIONS— INCLUDES SOME CALVING AREAS
- ▨ SPRING AND SUMMER ELK CONCENTRATIONS— INCLUDES SOME CALVING AREAS
- ▢ ANTELOPE RANGE
- 🟩 MOOSE WINTER RANGE
- * GOLDEN EAGLE NESTS
- 🟨 PRAIRIE DOG TOWN— REPORTED IN VICINITY
- ⇔ SIGNIFICANT MIGRATION ROUTES

prepared by:

WIRTH ASSOCIATES
ENVIRONMENTAL PLANNING and DESIGN
BILLINGS MONTANA

AESTHETICS - MAP No. 7

This term means many things to many people. It involves any or all of man's senses; a sunset reflected off the snow of high mountain peaks; the sound of rushing water; the fragrance of flowering trees or shrubs; the feel of a smooth water worn rock. Aesthetics, therefore, are in part a sensual thing. It can also be a fleeting glimpse of wild game in its natural habitat; a pleasant and casually natural pattern of open space and trees; a pleasing arrangement of ground forms and vegetation; a stream meandering through a meadow. It can be distant views of mountain ranges, the wind rippling across grasslands, or a soaring eagle. These are pleasurable experiences and they, therefore, have a definite value to man in that they lift his spirits and help to renew his basic affinity with nature.

All of these things can be seen and experienced in varying degree in the four alternate route corridors under study. They are most effective when the natural scene has been undisturbed by man's activities. The extent to which existing and proposed activities by man intrude and adversely affect the natural scene determines potential impact.

This impact cannot be quantified but it can be qualified. The qualitative analysis was made by traversing each corridor and recording section by section the impact which would occur by construction of an Interstate highway. These judgments were made through professional objective observation by landscape architects trained and experienced in evaluating aesthetics.

The Nez Perce route was viewed on the ground from each end and from the air. These observations, together with a detailed study of aerial photographs provided the basis for evaluating this route.

The potential physiographic impact on ground forms and stream channels and the vegetative impact on the three types of vegetative cover are integral parts of the natural scene. The results of these studies were used extensively in evaluating the potential aesthetic impact. The accompanying map graphically illustrates areas of high, medium and low aesthetic impact. An analysis and overall evaluation of each corridor follows.

Basin Route - Butte to Elk Park.

Almost all of the terrain in the immediate vicinity of the roadway has been altered by man in his past road construction and mining activities. Any additional road construction in connection with this route could do little more damage. There is, however, an excellent extended view of the Highland Mountains to the south available from here. The potential impact here is rated low.

Basin Route - Elk Park Section.

The aesthetic values in Elk Park relate to the restful expanse of the open park framed by the surrounding mountains. It creates a picture on a very large canvas and the highway becomes only a small element and does not dominate the scene. The potential impact on this section is rated low.

Basin Route - Bison Canyon.

Much of the potential aesthetic impact in this canyon has already been described under Vegetation and Physiography. There will be very large scars resulting from heavy side hill construction with attendant loss of vegetative cover. In places where the present road prism is not included in the new construction, it will constitute an additional scar. The many required channel changes will adversely affect the appearance of

Bison Creek for many years. Unfortunately in this narrow canyon the view shed or visual limits are very restricted and the eye will automatically be drawn to the roadway and its attendant scars. The potential impact is rated high.

Basin Route - Boulder Canyon

The route up Boulder Canyon encounters a series of very narrow canyon sections alternating with sections where the canyon widens out producing rather narrow and elongated open park like areas. The removal of the railroad as far as Basin will permit using this right-of-way to relieve the impact somewhat, especially on the narrow canyon sections. From Basin to Boulder the railroad remains and the Interstate is forced onto difficult ground with resulting heavy scars.

In the wide sections of the canyon it will be possible to control the aesthetic impact by using independent or split alignment, careful control of construction activities, protection of vegetation, etc. Also the view shed widens out which tends to reduce the impact of the road on the natural scene. The potential impact on these sections is rated low to moderate.

As the motorist approaches the narrow canyon section, with its limited view sheds, the cut and fill scars and vegetative destruction will again command his attention and the impact will be high.

There are a number of historical remains in this section but the impact on this component has been covered under history and archaeology.

It is difficult to assign an overall rating to this section, but in view of the fact that there are about five miles of high impact area, plus over 18,000 feet of channel change, the overall potential impact is judged to be high.

Although that section of the Basin Route extending across Elk Park and a few of the sections in Boulder Canyon have a low potential aesthetic impact, by far the larger part of this route is rated high. The overall potential impact on the aesthetic values in the Basin corridor is therefore considered to be high.

Nez Perce Route - Butte to Elk Park

This route begins, as does the Basin route, at the East Butte Interchange and for the same reasons impact here is rated low.

Nez Perce Route - Elk Park Section

From Elk Park Pass the route continues across the Elk Park flats to the mouth of Sawmill Gulch. Here again the view shed is extremely wide, the road scars will be minimal, and the potential impact on the aesthetic values is judged to be low.

Nez Perce Route- The Nez Perce Creek/Little Boulder River Canyon Section

This section, some 15 miles long, follows the Nez Perce Creek watercourse to the top of the ridge at an elevation of approximately 7,400 feet; crosses Little Boulder Park, and descends alongside the Little Boulder River in its canyon. This entire section with the exception of about one mile through Little Boulder Park requires heavy side hill construction with the resultant loss of vegetation and extremely heavy scars resulting from large cuts and fills. Both Nez Perce Creek and the Little Boulder River would be materially affected by channel changes, filling of the channel, etc. The view shed on this section is very limited and the motorist's attention will be drawn to the roadway and its scars. The potential impact on this section is rated high.

The terrain from the mouth of the Little Boulder River Canyon to the town of Boulder is open, rolling, grass covered terrain requiring light to moderate cuts and fills. The view shed here is almost unlimited with the town of Boulder in the immediate foreground and Boulder Valley in the background to the north and east. The views of the town, the surrounding mountains, the grazing and farming activities in this valley will all compete for the motorist's attention and the potential impact of the road on the aesthetic values in this section is considered to be in the medium range.

The overall potential impact on the aesthetic values in this corridor is considered to be high.

The Whitetail Route

With the exception of about a five-mile section over Whitetail Pass all of this route lies in an open, grass covered valley. The view shed is extremely wide and extends ridge to ridge on either side of the valley. There are also mountain views at both ends of the valley. Thus the views on this route are essentially panoramic and broad scale

The construction scars through the valley would be minimal for the most part and where some scarring does result the native grass cover can be readily reestablished. In this valley setting the roadway itself would not be a dominant element and the potential impact is judged to be low.

The potential impact in that section of the corridor crossing Whitetail Pass would be somewhat more severe than that in the valley.

However, this might be alleviated to some extent by using independent alignment for each of the two lanes in this section. There are several possibilities for developing overlook points in crossing the Pass which would provide splendid panoramic views of the valley below.

From the foot of Whitetail Pass to the town of Boulder the corridor crosses level to rolling grasslands where construction scars could be kept to a minimum. Here again the town of Boulder in the foreground and Boulder Valley in the background and the encircling mountains would tend to minimize the aesthetic impact of the roadway through this section.

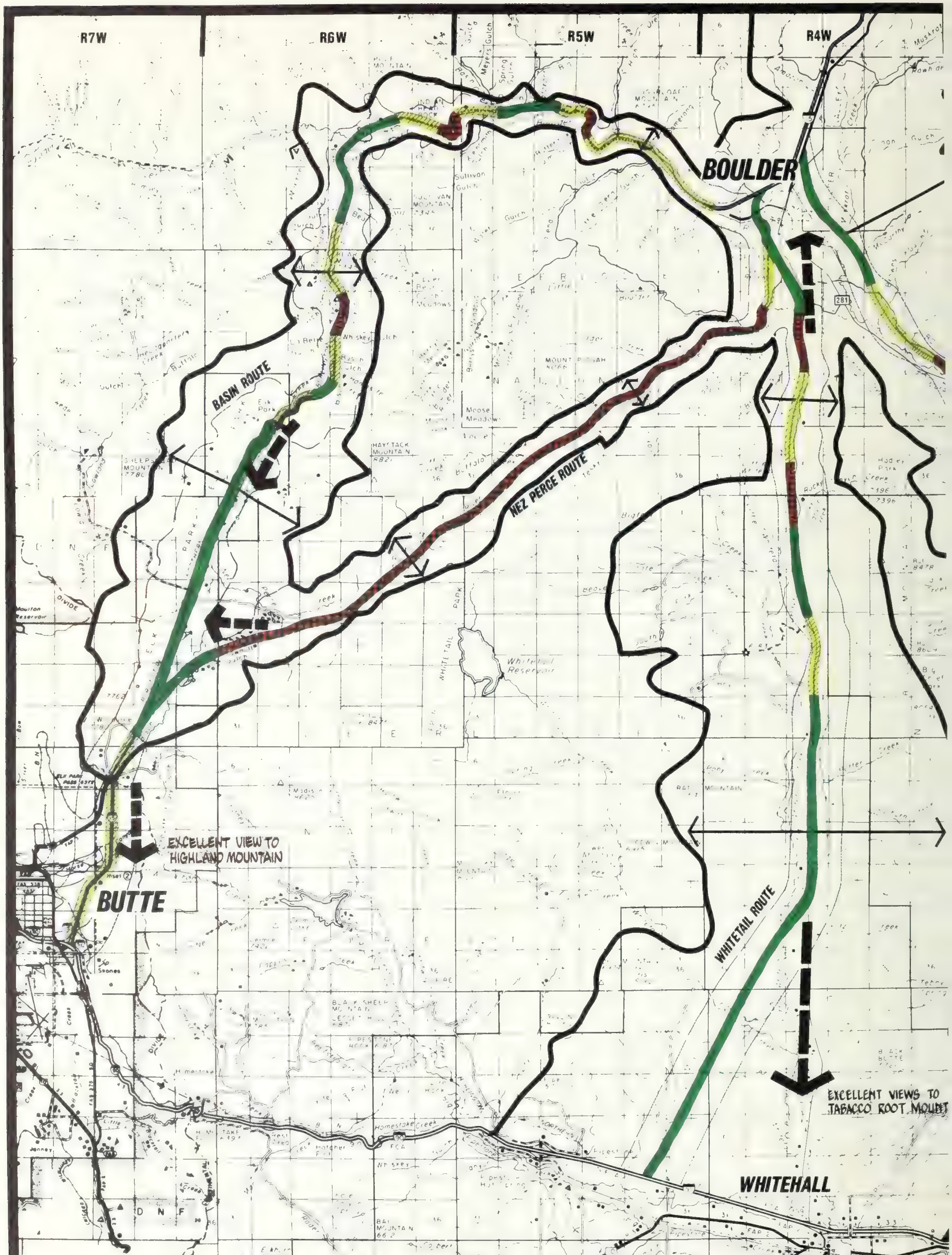
The potential impact on aesthetic values is judged to be medium.

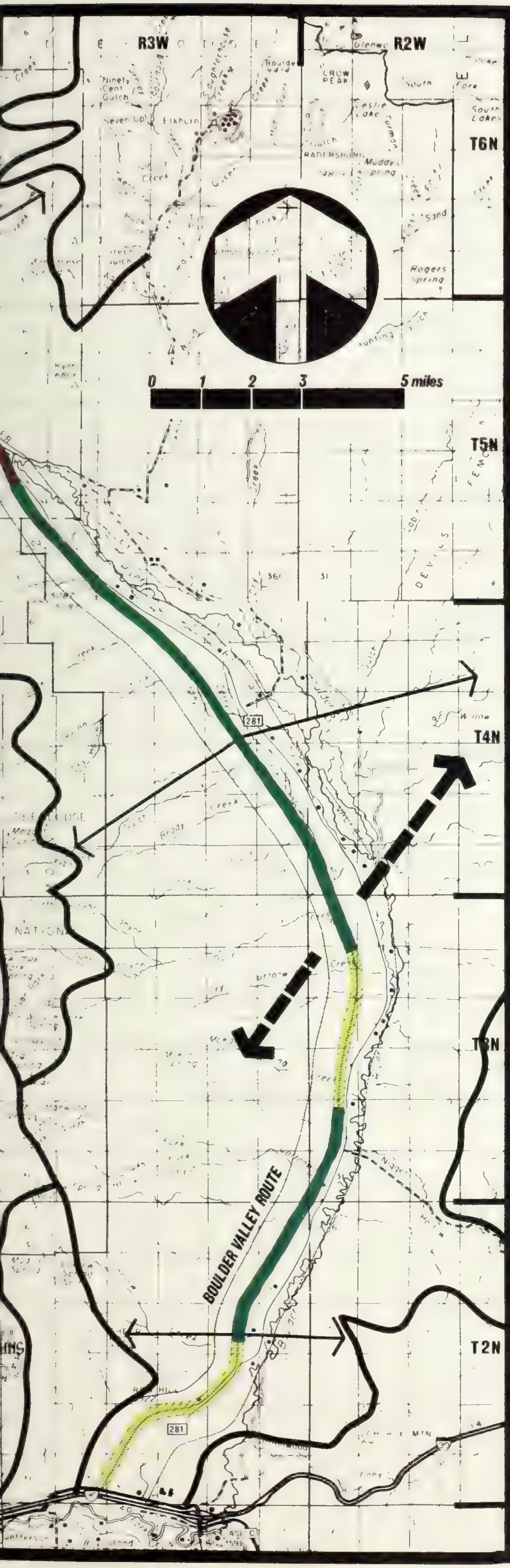
The Boulder Valley Route

This corridor, like the Whitetail Pass corridor, also follows up a broad, grass covered, rolling valley which follows the Boulder River channel. It has the same wide view shed encompassed by mountain ridges, broad scale panoramic views, and minimal construction scars. The roadway itself would not be the dominant element in the broad panoramic views on this route. The potential impact on the aesthetic values in this corridor are judged to be low.

POTENTIAL IMPACT SUMMARY

IMPACT KEY ● HIGH ◒ MEDIUM ○ LOW	BASIN ROUTE	NEZ PERCE ROUTE	WHITETAIL ROUTE	BOULDER VALLEY ROUTE
AESTHETICS	●	●	◒	○


R7W
R6W
R5W
R4W
BOULDER
BASIN ROUTE
NEZ PERCE ROUTE
WHITETAIL ROUTE
BUTTE
WHITEHALL
EXCELLENT VIEW TO HIGHLAND MOUNTAIN
EXCELLENT VIEWS TO TABACCO ROOT MOUNT
HAYSTACK MOUNTAIN 8821
SHEEP MOUNTAIN 7780
Moose Meadow
Whitetail Reservoir
Moulton Reservoir
Elk Park
Homestake Creek
281
R 7 W



7 AESTHETICS

DEGREE OF AESTHETIC IMPACT

🟥 HIGH

🟨 MEDIUM

🟩 LOW

VISUAL CONDITIONS

|←→| VISUAL RANGE

➔ SIGNIFICANT EXTENDED VIEWS

prepared by:
WIRTH ASSOCIATES
ENVIRONMENTAL PLANNING and DESIGN
BILLINGS MONTANA

IV. SUMMARY AND CONCLUSIONS

The Overall Impact Evaluation chart that follows, gives an overall summation of the potential impacts which might occur along each of the four alternate routes. The ratings shown are based on factual inventory data, field reconnaissance and professional judgment. No attempt has been made to precisely quantify the ratings; this is not possible in evaluating potential environmental impacts. The study was performed as objectively as possible making use of all available sources of data within the allotted time schedule.

No specific recommendations are made regarding preferred routes or alignment variations. The findings included in this section will be used in conjunction with the monetary, engineering, and socio-economic assessments being prepared by others. The complete analysis will provide the basis for selection of one of the four alternates.

NATURAL ENVIRONMENT-
OVERALL IMPACT SUMMATION

IMPACT KEY
● HIGH
◒ MEDIUM
○ LOW

		ALTERNATE ROUTES			
	ENVIRONMENTAL COMPONENTS	BASIN ROUTE	NEZ PERCE ROUTE	WHITETAIL ROUTE	BOULDER VALLEY
1	**HISTORY and ARCHEOLOGY**	◒	○	◒	○
2	**RECREATION**	●	◒	○	○
3	**PHYSIOGRAPHY**	●	●	◒	○
4	**GEOLOGY**	◒	◒	◒	○
5	**VEGETATION**	◒	●	◒	○
6	**WILDLIFE**	◒	●	◒	○
6	**FISHERIES**	●	●	○	○
7	**AESTHETICS**	●	●	◒	○

V. COMMITMENTS OF RESOURCES (NATURAL ENVIRONMENT)

The following resume covers environmental resources which will be irreversibly and irretrievably committed by construction of a four-lane Interstate highway in each of the four alternate corridors.

HISTORY AND ARCHAEOLOGY

On the Basin route certain locally significant historical remains may be permanently lost through construction activities. Others will be affected by loss of access.

The historical aspects of the Whitetail Pass route relate to its importance as an early stage route. The only surviving remains are several sets of ruts from the old trail which may or may not be irretrievably lost depending on the detailed highway location. There are no significant historical remains on either the Nez Perce or Boulder Valley routes.

There are no major visible archaeological sites on any of the four corridors. Routine salvage archaeological reconnaissance on the chosen route would provide records of areas of minor importance.

RECREATION

The existing and future recreational potential along present U.S. Highway 91 between Butte and Boulder is considerable. The creation of a limited access highway corridor through this area is an irreversible and irretrievable commitment for the life of the project. It will adversely affect both the quantity and quality of the recreational activities in this corridor through lack of access and because of the noise and air pollution.

The same comment as above also holds for the Nez Perce route but to a lesser degree because there are fewer existing facilities and the future potential is limited. The existing and potential recreational uses along the Whitetail and Boulder Valley routes are minimal and there are no irreversible and irretrievable commitments of recreational resources on either of these routes.

VEGETATION

Existing native vegetation lying within the paved roadway prism would be committed irretrievably on all alternates. The restoration of cut and fill slopes and other scarred areas could be accomplished in time with proper care and new techniques. Native grasses could be quickly reestablished; deciduous trees, shrubs and ground covers in a matter of a few years; coniferous trees may take many years to reestablish but new planting techniques plus periodic watering and fertilization could speed up recovery. For this reason the initial loss of native vegetation is not considered irreversible.

WILDLIFE

The removal of vegetation within the right-of-way of any of the alternates would constitute an irreversible and irretrievable commitment of resources with respect to wildlife since it would reduce available browse areas for deer, elk, antelope and moose and it would reduce cover and habitat for small animals and birds. The most severe effect would be caused by construction of the Basin or Nez Perce routes. Construction of the Whitetail Route may affect migration movements of elk and antelope. The Boulder Valley Route would cause the least ill effects in this catagory.

FISHERIES

On the Basin route about six and one-half miles of new channel would be required on Bison Creek and the Boulder River. Some of these changes are on sections of the streams previously altered by construction of the railroad and existing Highway 91. However, changes which require filling of the virgin stream channel would be an irreversible and irretrievable commitment of that resource.

On the Nez Perce route both Nez Perce Creek and the Little Boulder River are pristine streams. Any changes or alterations of these streams would constitute an irreversible and irretrievable commitment of the present resource.

There are no irreversible or irretrievable commitments of fishery resources on either the Whitetail or Boulder Valley routes.

PHYSIOGRAPHY

All four alternates involve changes and alterations to existing ground forms to a greater or lesser extent and these changes represent an irreversible and irretrievable commitment of this resource. On sections of both the Basin and Nez Perce routes, the changes in the physiography including stream changes, are major and extensive. On the Whitehall route they are minor except for the six mile section over the Pass. On the Boulder Valley route they are minor throughout.

AESTHETICS

Certain existing scenic and visual qualities in all four corridors will be irreversibly and irretrievably committed because the construction of an Interstate highway in any one of them will unavoidably change the natural scene This change is caused by the loss of vegetation alteration of ground forms, stream channel changes and other activities, the overall result being a permanent deterioration of the natural scene.

This commitment would be extensive on the Basin route in Bison Canyon and in portions of the Boulder River Canyon. On the Nez Perce route there would be a heavy commitment on the Nez Perce Creek and Little Boulder River Drainages On the Whitetail and Boulder Valley routes where construction scars would be minimal and where the primary scenic qualities relate more to distant panoramic views, the resource commitment would be minimal

APPENDIX TO SECTION IV

THE NATURAL ENVIRONMENT

AGENCIES OR INDIVIDUALS CONTACTED

Bureau of Land Management, Dillon District Office,
Dillon, Montana - Mr. Jack McIntosh

Montana Bureau of Mines and Geology, Butte, Montana

Montana Department of Fish and Game, Bozeman, Montana

Montana Department of Fish and Game, Sam W. Mitchell Building,
Helena, Montana

Montana State Highway Commission, Helena, Montana

Resources and Planning Bureau, Montana Department of Natural Resources
and Conservation; Sam W. Mitchell Building, Helena, Montana -
Mr. Jack Acord

Taylor, Dr. Lee, University of Montana, Missoula, Montana

U.S. Forest Service, Deer Lodge National Forest,
Butte, Montana - Mr. George M. Smith

U.S. Geological Survey, Helena, Montana -
Mr. Don Coffin

U.S. Soil Conservation Service, Bozeman, Montana -
Mr. A. B. Linford - Snow Survey
Mr. Frank Ferentchak - Watershed Projects

U.S. Soil Conservation Service; Jefferson Valley Soil and Water
Conservation District, Whitehall, Montana

Western Interpretive Services, Sheridan, Wyoming -
Mr. Robert Murray, Historian Inerpretor

HISTORIC AND ARCHAEOLOGICAL ANALYSIS
of Four Alternate Routes, Boulder to Butte, Montana

Prepared by:
Western Interpretive Services
Sheridan,Wyoming

Interstate Highway Impact Relative Historic Sites

We recognize the first thing that probably comes to mind on mention of this subject is outright destruction of a site by the construction activity. We would propose that the effect is more complex than this Both Positive and negative elements to the impact exist, and they depend very much upon the nature of the site and the precise locational relationship of the site to the highway.

As to outright destruction of a particular site, we would have to observe that we believe if a site is truly historic, and not merely old, then it should be possible to route the highway in such a manner that the site is not physically endangered. This brings up the question of significance, and establishes a need for some criteria on which to base a statement of significance. We use the basic criteria of the National Historic Preservation Act of 1966 and appurtenant regulations as the framework for our determination of site significance. In brief, a site or building might be the place where an event of national significance occurred. It might be directly associated with some pivotal event or period in the life of a nationally important figure. It might be significant architecturally because it is the work of a nationally recognized architect or engineer. It might also be significant architecturally because it is a particularly good and representative sample of the architecture of a period, a region or a locale. These would constitute the frame work of a national significance criteria.

Under the terms of the Historic Preservation Act of 1966, it is possible under similar criteria for a site or building to possess similar significance at the state or local level. For the most part this further consideration in Montana has been limited to date to the addition of certain key state and local significance sites to the state "consensus list" of historic properties that forms a part of the state-wide comprehensive historical plan. Few communities have established an active program of evaluation and classification of structures or districts under the terms of the act, but we would expect to see an expansion of this kind of activity at a rapid rate over the next few years.

We should note particularly that the Act provides for the creation of historic districts in which a number of structures that are part of an over-all scene may be preserved as a part of that scene even if they are not individually of outstanding significance. This concept has come into widespread recognition in the past several years, and is integrated into a number of kinds of community development planning across the country. As a preservation concept, it has application at the state and local levels of significance as well. We believe that major construction activity should be routed around locales that have a potential for development of such districts.

In our own extensive experience of travel on interstate highways, we have found that one of the most attractive features they provide is the generally elevated viewpoint resultant from their engineering approach to travel through rough country, and the opportunity this affords for sweeping panoramic views of large scenic areas. The very characteristics that make them serve this function well make them unsuited to the satisfactory traveler experience in an area with a number of historic sites, a number of interesting old structures, or interesting "pockets" of natural history or small-scale scenic attractions. In these cases the interstate tends to sweep the traveler by without adequate opportunity for intimate association with the resource itself, which can only be achieved at relatively close range. In this situation, we feel the interstate highways should be used to do what they were conceived to do best, that is to move the greater volume of commercial traffic rapidly along short and non-disruptive routes, leaving the existing road network to provide connecting access to the historic and scenic byways of a region.

Now one of the cultural and economic disadvantages to all this is that all too often, the traveler on the interstate system gets caught up in the whole process of high-speed travel, and stays in the interstate in areas where it would be to his own advantage and to the advantage of the region for him to diverge to alternative highways and roads and see the country in greater depth. The answer of course is not to wind the interstate circuitously into the byways, but to provide adequate connection to other alternative routes coupled with sufficient information about the attractions of those routes, so the tourist will know what is out there and take advantage of it. If this is done, then the proximity of the Interstate will have quite a different sort of effect on historic and scenic byway attractions. In general it will serve as a feeder to bring a much larger volume of traffic into the region, and with proper information more visitors will find and enjoy the attractions in question. This of course will increase their length of stay in the area, to the very direct economic benefit of the entire region.

With a properly integrated system of informational media, the proximity of an interstate highway with good connections will markedly increase the in-depth visitation. It may increase it sufficiently to sharply expand the feasibility of doing something in the way of interpretive development for natural and cultural history along the alternative routes. We have been studying these phenomena for some time. In one noteable case in a nearby state, the provision of adequate information on the interstate has within a year tripled visitation to a little-known historical project. In other instances the drawing off of heavy commercial traffic by the interstate has increased the attractiveness of roadside natural-history interpretation.

General History of the Study Area

The roughly triangular area embraced by the study corridors has a late-starting history compared to many parts of Montana. Early explorers bypassed the area along major transcontinental easy gradient routes to the north and south. Fur traders and the ubiquitous "mountain men" almost unquestionably worked their way through these hills and valleys, but again, the major routes of this commerce bypassed the area, and there were no major trading posts within it.

Like many areas of Montana, this region comes into history with the opening of mining activity. In this case mining remained one of the dominant economic pursuits throughout much of the time since the first discoveries. Several stages of mining activity are represented in the surviving remains of mining development here that have been overrun by still later developments in other areas of the region, giving some of the mining remains here a "period-piece" interpretive value that may exceed their strictly historic significance in some cases.

Paralleling the mining development of the region was a development of communications and transportation facilities, and the area holds several historic survivals from this field of history.

The speed with which mining activity overran the area and planted a sturdy and fairly well-organized population brought an end to the military aspects of the "Indian Problem" at a very early date here. Thus the area contains no major Indian Wars sites such as those found elsewhere in the state.

Ranching history begins substantially concurrent with the coming of beef herds to feed the miners, but a stable, settled ranching economy came to the region rather late, with its primary focal point along the valleys that were capable of supporting irrigated hay production and the production of winter feed crops. Most of the major ranch properties are of fairly recent origin, many too recent to qualify for protection under the terms of the Historic Preservation Act.

Most of the other aspects of economic and cultural history have been centered in the urban areas of Butte and of Helena, leaving most aspects of area history concentrated in the fields outlined above.

Mining History

The mining history of the area opens in the summer of 1862. Montana Pioneer Granville Stuart records the arrival of "Powell" (John W. Powell) in the Deer Lodge valley on August 7th, 1862, with work of "finding good prospects, east of the Rocky mountains on Boulder Creek." On August 10, he reports:

"The little village is all astir today. There is a general stampede over the mountains to Powell's new discovery. Some are buying horses, some trading, everybody packing grub and mining tools, each one in a hurry to get out ahead of the rest."

The next several years saw much frantic stampeding back and forth over this general region of Montana, but 1864 is the real opening-year for most placer activity in the whole region from present Butte to Helena. Stuart gives this account of its origin:

> About the middle of January, 1864, a regular stampede craze struck Virginia City. The weather had been quite cold and work in the mines was temporarily suspended. A large number of idle men were about town, and it required no more than one man with an imaginative mind to start half the population off on a wild goose chase.

After several such excitments, Stuart reports "the next great excitement was caused by a rumor of new rich discoveries on Boulder creek, a branch of the Jefferson." He then recounts the adventures of his friend Reece Anderson, who "returned in about two weeks without having found any big thing in the way of gold mines, but he had accumulated quite a valuable stock of experience...."

U S Geological Survey figures indicate that placer production of gold reached a maximum during the years 1868-1872, tapering off after that time until the revival brought about by machine working of placers in the 1930's. Most of the creek valleys in the vicinity have been worked for placer gold, in some cases repeatedly by different technology, though the total gold production from this source is not comparable to that from major placer workings in the region.

Boulder River, from Boulder up to Basin, Basin Creek and Cataract Creek have all been worked extensively for placer gold, but the total yield probably does not exceed $200,000 out of a total figure of $3,811,263 for all of Jefferson County's placer gold production. In view of this, we would not envision the placer workings along these streams as having much strength of significance at the state or national level. Several years ago our firm participated in the planning of roadside interpretation of placer gold workings at the Jefferson City rest area for I-15. When completed this exhibit will effectively tell the story of the major placer gold extraction in the region, and we believe that this story need not be duplicated so close by.

Lode Mining

The hard-rock mining potential of the region was realized in the late 1860's and in the early 1870's, but the capital necessary to exploit these resources did not generally become available until the 1880's and later. This was largely because there were mineral deposits not far away that promised a greater yield in relation to investment, and were located closer to practicable processing and shipping points. We refer of course to the major developments around Butte and around Helena.

U. S. Geological Survey figures for the three districts grouped closely in and around the study corridors indicate a 1902-1957 metals production in excess of $12,000,000. This is not a staggering figure in the overall economics of Montana mining; it is enough, however, to give the major properties in the district some historic significance, and we believe such a volume would indicate state significance. In a county where the gross receipts from livestock sales have seldom exceeded $1½ million dollars and the gross receipts from crops have seldom reached $½ million in a single year, the local impact of mining is evident.

Mining in the immediate region has declined steadily as an economic factor during the past twenty years or more, as recovery costs have outpaced the rise in metal prices. For some time to come, it would appear that marginal mining areas are likely to remain among the "has been" areas of Rocky Mountain mining. The past significance of mining in the region would lead us to suggest that the most important mining properties in the area be preserved as evidences of the historic past - regional period-pieces as it were - in this function they may be more valuable than pure historic significance would determine them. Surely if mining resumes on the more productive deposits in the distant future it will be a very different sort of mining than that of the past (as shown by this very sort of happening today in Arizona.)

Some mining properties and related facilities lie within or closely adjacent to the study corridors, particularly the one along existing U.S. Highway 91. We shall examine these on a corridor by corridor basis:

The Basin Route

Free Enterprise mine:

Reportedly this was an early mine, yielding high grade silver ore. Production figures are not on record. Subsequent to 1949 it was reopened as a prospect for radioactive minerals. This mine does not appear to have a high degree of historic significance even at the local level. We examined its record due to its prominent place on recent maps, and its proximity to the route.

High Ore Creek:

Near the point where High Ore Creek crosses the highway our field team found structures that are apparently related to the last phase of placer mining of the nearby Boulder River placers. Ruppel reports that in 1870 this area produced the largest volume of placer gold in Jefferson County. There have been several desultory reopenings of placer activity since that time, but none appear to have been very profitable.

We include these structures largely because of their proximity to the present highway, and their potential as part of the "total roadside scene" that figures in the preservation potential for this route.

High Ore Mine:

Described as an "intermittent small producer since 1905", this mine had its largest reported production of lead, silver, copper, zinc, and gold, in 1947.

Individually the property has but marginal local significance, and was brought under study because of its location within the margin of the study corridor.

Great Northern Railway trestle:

This structure crosses the river at a point not far from where it emerges from a tunnel. This rail line was built primarily to serve the several mining districts lying between Butte and Helena. This particular structure, crossing both the river and the highway is a graphic illustration of the technical problems posed by transportation in the mining country.

We would rate it as a significant part of the mining history scene along present U.S. 91.

Obelisk Mine:

This is another intermittent small producer, with the main part of its activity in 1920-21 and in 1954. Individually it is not particularly significant as to production, but we have included it here because of its close proximity to the highway which makes it very much a part of the "mining scene" to passing visitors.

Basin Quartz Quarry:

This large mass of nearly pure quartz has supplied this material for use as metallurgical flux in the smelters at Butte. U.S.G.S. estimates production at least at 200,000 tons.

We would rate this property as significant in the overall mining history of the area, and of special potential in telling a part of that story to travelers.

"Earth Angel Mine"

This roadside property could not be connected with any really productive property covered by state or federal mining data. From the promotional signing, it is evident that is another of the slightly radioactive properties like many in this area, and is exploited as a so-called remedy like several similar properties in the area. It has no historic significance.

Between this point and Basin, the Montana Highway Commission has a roadside historical marker, devoted to a brief statement of the mining history of the region. We would respectfully suggest that this marker might be replaced by a more durable and attractive exhibit comparable in construction media to that planned several years ago for the Jefferson City Rest Area.

Two mines provide a first view of the more concentrated mining developments at Basin itself. One of these on the north side of the highway, remains unidentified at this time, largely because of the density of mining activity here in relation to the map scales involved in available mapping. We believe it is one of the outliers to the Hope/Katie or Basin/Jib complex, most of which is located on the other side of town, as its mining structures appear to be from the same period.

Merry Widow mine:

U.S.G.S. publications and records show no production figures for this property, and we believe it to be of marginal economic and certainly very marginal historic significance. Its importance at this point would be largely as part of the total mining history scene at Basin.

Basin townsite:

We are listing Basin townsite with the mining properties, since through most of its history it has been closely associated with mining in the region, and this forms the primary reason for its existence.

The history of Basin spans the entire hard-rock mining period in this region. It served as a supply point for such other settlements as Comet lying in the hills to the north, and a host of outlying smaller mining developments.

The towns buildings are a sort of cross-section of the architectural styles and types of the whole period at Basin. They range from log cabins of varying age, through tarpapered board shacks, a wide variety of frame cottages, on up to a few brick business buildings built on the strength of the mining boom in the 1920's. The church is a particularly interesting structure.

The 1970 census reports around 300 people as Basin, so it is now a "ghost town." Basin possesses many of the visual attractions of ghost towns, yet it is reasonably well-kept and does not pose a public preservation problem, as Montana's ghost towns sometimes do. We think that like many towns similarly situated in relation to population centers of the region, Basin's future probably lies in tourism and outdoor recreation. We have become thoroughly familiar with the impact of this change from mining to recreation-oriented occupancy at several places, and particularly at Atlantic City, Wyoming in the South Pass mining country. If the people at Basin wish to preserve some of the "local color" from the mining days, then one of the logical moves would be to create a "historic district" under the terms of the historic preservation act, which could form part of the framework for local planning and zoning. We have no indication that this is under consideration, but if such a district were formed, it would have some immediate impact upon the planning context of any adjacent interstate highway and connecting routes.

The Jib mine and mill complex - (Hope-Katie, East Katie, etc., at least 15 properties involved)

Just to the west of Basin townsite lies the major mining development within the entire set of study corridors. Its story is fairly recent history, but is a representative example of what can happen to a marginal property, given a streak of good paying ore and some effective promotion. The mine was worked irregularly from around 1900 to 1919 and did not particularly stand out in relation to more spectacular developments out in the hills to the northeast (Comet, Corbin, Wickes, Elkhorn, each in their own particular periods.) Then high grade gold ore discovered in 1919 formed the basis for extensive promotion and development. The Jib Consolidated Mining Company greatly expanded the underground developments and built the substantial Jib Mill that stands in ruins today. By 1925, production had not caught up with development costs, and the entire property went into a trusteeship, and was ultimately closed down and sold, first to the Basin Cataract Mining Company and then to Roy E. Miller, Inc. These firms invested considerable money in the additional development of the mine and mill, but the mine was not a significant producer after 1934. There was a brief revival of development work in 1954, but as with most activities in Montana and Wyoming in the period, it did not result in an effective reopening of the mine.

The U.S.G.S. reports a total production of around $2,500,000 in metals from this group of mines, and this, along with the economic impact of investment and construction with outside capital, has made it a major factor in the economic history of the local community. In this sense it might be called a state-significance property, though it is overshadowed by the mining activities at Wickes, Corbin, Elkhorn and Comet in overall significance.

The Lotta mine:

This property attracts some present interest because it is located less than 50 feet from the side of Highway 91. U.S.G.S. records indicate it has been a very minor producer, and we do not think it has much significance except as a part of the roadside mining scene.

Boulder Mine:

Just outside the study corridor to the west of the properties discussed, and to the north of the study corridor along U.S. 91, lies the Boulder Mine on the S.E. slopes of Pole Mountain.

This is one of the most "historic" of mines located close to the study corridor. It was opened at least as early as 1881, but was worked only intermittently through the nineties and early 1900's. From 1931 through 1957 it was worked at least some each year, yielding a small, but steady production of gold, silver, lead and zinc, with the proportions varying considerably from year to year. Total production volume is low enough, however that the mine has not likely had much historic impact beyond the local community.

Indian Head Rock:

This is a well-known scenic attraction in the region, lying not far from the highway. We include it because of the barite deposits here that are owned by the Radon Research Corporation of Boulder, Montana. The U.S.G.S. asserts these are probably not a commercial value. There has been no mining of the deposit, and the formation is not historic; it is just one of the scenic attractions of the route.

Other mining related sites in this vicinity:

There are some additional mining properties scattered along the two miles of road immediately above Basin. U.S.G.S. files do not show significant production for any of them, and we do not regard them as possessing particular historic significance.

From a standpoint of tourist understanding of the mining history of the region, the visible portion of an old flume is probably the most important, though it would not be regarded as "historic."

In this area also is the "Bluebell Health Mine" one of the first of the crop of so-called healing establishments to found itself in the wake of all the publicity about radioactive materials and medicine in the 1950's. It does not have historic significance.

Moving up Bison Creek and through Elk Park, one leaves the Basin/Cataract Mining District, and passes through an area of very little mining activity. Off to the west, along Lowland Creek lays a region of extensive placer mining, but this is well away from the study corridor. The cluster of houses and other old buildings near the mouth of Bison Creek may well relate to some of these upstream placer developments.

Off to the west of Elk Park there is a group of mines dominated by the Butte/Elk Park Extension mine. The Montreal Star is a more recent mine at the south end of this region of mining activity. These mines appear responsible for the small ore loading facility at Elk Park station.

Non-mining sites and structures along Highway 91 from Basin to the continental divide were covered. We have recorded all of the visible signs of habitation between these points. They represent largely ranch properties, none of them historic, most merely old, adding to the general scenic resources of the area.

The Nez Perce Route. This route is the shortest in probable construction mileage of the four study corridors. It passes through an area of very little development.

There were only two mining properties lying within the study corridor The first was the Wilson Creek Placer and it was a very minor producer and we regard it as relatively insignificant even at the local level. The second is the Ironside Mine. This is but one name that covers two properties (Shields as well) and it was primarily a lead and zinc mine with lead the most important product along with a little silver It was never a volume producer and we attach only minor local significance to it.

Farther northeast along this route the Nickelodeon mine is the only other mine lying very close to the edge of the corridor. It is a uranium bearing copper deposit of low grade, and has not been historically significant.

The power line which generally follows the Little Boulder River canyon and continues on over Nez Perce Pass was originally built in 1901 by the Missouri River Power and Light Company. Portions of the old corduroy road which was built in advance of construction still remains. These properties are not listed in either the State or National registers. We regard the Nez Perce route as by far the best route from the stand point of minimal disruption of historic properties of any kind.

The Whitetail Route. There are no significant mining properties within the Whitetail Route. The closest mining properties are the Big Foot Placer, the State Mine, and the Big Four group of mines, which, as our maps indicate, lie well outside the corridor. They are at best of marginal mining importance, and have no consequential historic significance beyond the immediate rural area involved.

There is, however, a degree of historic significance to the whole route, and at least some historic sites involved, which in terms of significance exceed that of the mining properties we discussed along the Basin Route. These sites are related to the history of early transportation through the area.

The main stage route from Helena, Montana, to Corrinne, Utah roughly followed the county road that runs from Whitehall to Boulder. Working from aerial photo coverage of the route, due to snow conditions, we have endeavored to pinpoint those areas where the old route is preserved.

For nearly twenty years this was Montana Territory's most important communications line, and the route over which virtually all important mail and express of high priority reached the territory. We believe that as a historic entity, the stage route has both state and national significance. Sites directly related to it that have not been entirely overrun by subsequent development should be preserved.

In the community of Whitehall are two surviving stage stations from this line. One is called "Brooks' Log Stage Station" and the other "Whitehall Stage Station." Both are on the State of Montana's historic sites inventory and are included in the State's Historic Preservation Plan.

At the north end of the route is the site of the original Boulder Station on the stage route. Note especially that it is not on the present Boulder Townsite, but is well out of town in a relatively out of the way place. From this location we would expect that it may be a "clean" archaeological site, and one that would be an important candidate for historic sites archaeology if it were directly endangered by highway construction. The location has been determined by examination of the earliest public land survey plats for the area, and we feel it is quite precise.

The early survey plats show two ranches located along the stage line within the corridor under study. These are the "C. L. Dearborn Ranch," and the "Black's Ranch." In view of their location it is possible that either one may have served some auxiliary function relative to the stage line operations in the area. The Dearborn site has continued in use for ranching purposes, and more modern developments have probably destroyed the old site. The Blacks' site may, like the Boulder Station site, be relatively clean and a candidate for historic sites archaeology.

We have examined the large-scale aerial photo coverage of this route, and have located what we are certain are sizeable segments of the old Helena/Corrinne stage coach route. Most of the length of this route has been overrun by the existing county road, but we have marked on the aerial photo prints the key surviving sets of ruts from this trail.

We believe that special care should be taken to preserve these from damage attendant to construction activity.

The Boulder Valley Route. The Boulder Route passes through a region that was late in settlement. For the most part, settlement begins along this route in the 1890's with the development of private irrigation projects to raise hay for winter stock feed.

The entire route contains no historic sites of State or of National significance.

The only consequential site of local significance appears to be Boulder Hot Springs, a resort dating from 1883, which lies not far from the projected construction line in the north end of the route.

This route would appear to be less desirable as a construction route than the Nez Perce or the Whitetail route, because of the considerable number of farm and ranch operations that would be disrupted by the Interstate here.

This route would be less disruptive of scenic and general tourist resources than the Basin Route.

The Archaeological Situation

We have examined virtually all published source materials on the archeology of central Montana, and have conferred with Dr. Lee Taylor of the University of Montana, Dr. Leslie Davis of Montana State University, and with Stuart W. Conner of Billings, all noted authorities in this field. They confirm our findings that no significant recorded field work has been done in this region.

Work on the entire surrounding region gives evidence of a long human occupancy. Loendorf has postulated a seasonal life cycle for much of late and middle prehistoric times for this general region, based upon his analysis of over 180 sites in the Pryor Mountain region of south central Montana. If we accept the Loendorf propositions, this immediate area should have a scattering of sites that would be mostly transient summer hunting-camp sites. Winter conditions would rule out major concentrations of winter camps except in the timbered area along Boulder River in the Boulder Route.

Mr. Wesley Woodgerd of Montana Fish and Game Commission reports the existence of numerous petroglyph or pictograph sites in an area indicated on our maps north of Big Foot Creek, but well out of the way of projected construction on any of the routes.

We have examined the Highway Commission aerial photographs of the construction corridors in detail. Those for the Basin, Whitetail and Nez Perce routes are at a fairly large scale. We find no visual indications of major sites on these. The coverage for the Boulder Route is of too small a scale to be completely reliable, but we found no indications of major sites. The topography of all the construction lines shown on the aerial photographs virtually excludes the probability of any bison-drive ("buffalo jump") sites to be endangered by construction along any of them.

It is our recommendation that routine salvage archaeology reconnaissance be made along the chosen line of construction as is the usual practice for such projects.

We would rate the routes as follows in desirability from an archaeological standpoint:

Nez Perce Route - By all standards this is the best route from the fact that it represents a shorter linear disturbance, and it passes through country that contains a lower probability of numerous sites.

The Basin Route - An examination of the projected construction line indicates most of the country that would be disturbed by this route has already been subjected to road, railroad and mining activity to such an extent as to warrant a belief that most of its best probable sites have already been destroyed by the same processes that have given it a larger number of historic sites.

The Whitetail Route - This valley route may have seen frequent use as a good trail. We would suggest that "points" and hills at the valley margin along the construction route might be good locations for summer transient hunting camps. It is less disturbed by other activity, and therefore may have more well-preserved sites than the other routes.

The Boulder Route - This route would probably have the same kind of sites as the Whitetail route, but it might have a few more probabilities of sheltered wintering sites near the stream.

In summary, we think the Nez Perce route has the least probability of disturbance of archaeological sites. There is little to choose between the other routes as to archaeological probabilities, though the Basin and Boulder routes have been more disturbed by historic and recent activity.

Comparative Recommendations as to Routes

I. Our first choice from the historic and cultural standpoint would be the "Nez Perce" route. It provides a minimum-mileage route for commercial traffic plus good connection-points to existing U.S. 91.

This route would not disturb any state or national significance historic sites, nor any local significance sites that we have been able to locate.

Use of this route would markedly enhance the attractiveness and development potential of a historic/scenic alternative route on existing U. S. Highway 91.

II. Second choice would be the "Whitetail Route." It possesses the larger number of possible historic sites next to the above route.

Special caution should be observed on this route to avoid disturbing well-preserved segments of the old Helena/Corrinne stage coach road.

This route will require the largest amount of archeological on-the-ground reconnaissance of the four routes, and holds the potential for the discovery of the largest number of sites requiring salvage archaeology during construction.

III. Our third choice would be the "Boulder Route." This route follows a valley that has been settled and developed but recently. Much of the irrigated farming and ranching activity on the valley floor has overrun the relatively few earlier ranching sites. While in a technical sense the existing ranch properties here are not "historic" for the most part, still some of them may achieve local or state significance, given time.

Most important, viewing the continuity of historical process, we would observe that this route, more than the ones above, would disturb current and well established economic activity and cultural patterns in the region without a comparable offset in tourist attraction and spending.

IV. Last choice as a route would be the Basin Route, which would directly affect a much larger number of state and local significance historic properties than any other route. As we have indicated elsewhere, the mining developments at Basin were of strong state significance for a considerable period.

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ENVIRONMENTAL IMPACT ON FISH, WILDLIFE AND RECREATIONAL RESOURCES ALONG THREE ALTERNATE ROUTES FOR

Interstate 15-3(11)(12)(13)

Boulder to Butte

MONTANA FISH AND GAME DEPARTMENT
ENVIRONMENTAL RESOURCES DIVISION

March 1, 1972

I. DESCRIPTION OF EXISTING WILDLIFE AND RANGE

A. Basin Route

Mule deer are the predominant species of big game throughout the Boulder-Elk Park highway corridor. Elk, moose, and black bear are the other major big game animals which frequent the corridor. Generally, these animals remain at higher elevations during the summer months, and utilize the lower south-facing slopes along Bison Creek and the Boulder River as wintering areas. Deer and elk use of bottom areas and unroaded side drainages immediately adjacent to the Boulder River has been noted as late as the last week of May, indicating that for a minimum of six months the bottom lands in and along the corridor are used by big game.

Browse transects and observations near Bernice and Basin support the contention that deer use browse on south-facing slopes near the Boulder River.

In addition to big game, other wildlife such as mountain grouse, snowshoe and cottontail rabbits, coyotes, squirrels, song birds, furbearers, several types of rodents, members of the cat family, and some types of waterfowl utilize the vegetative cover which now exists along the Boulder River and Bison Creek. The present highway through this area was built in the early 1930s, so there has been ample time for disturbed areas to be revegetated. Both streams have abundant growth of willows and other vegetation which provides excellent food and cover for wildlife in the area. Heavy human use presently discourages use by game animals in the canyon bottom lands. This use could be expected to increase if the human use diminished.

B. Nez Perce Route

With the exception of the first few hundred feet on both ends of this alternate, this route is located in summer range of big game animals and is inhabited by all species of wildlife mentioned in the Basin Route Section. The area normally receives heavy snowfall and migrating species of animals move to stream bottoms or open slopes at lower elevations. Winter use by moose takes place along the Little Boulder River bottoms and significant use by deer and elk occurs along south-facing slopes.

Because the area receives little vehicular traffic during summer months and essentially none during winter months, all forms of wildlife now enjoy a virtually pristine environment.

C. Whitetail Pass Route

Mule deer, elk, moose, black bear and antelope are the principal species of big game in the area of this alternate route. Other wildlife and species of game birds which reside in the area are generally the same as those which are found in the Basin Route area.

Wildlife habitat on this route is similar to that found in the Basin and Nez Perce Routes for approximately 4.5 miles. The habitat then changes to open grassland, which accounts for the presence of antelope in the area. The antelope herd generally utilizes the area in the south portion of the valley.

Other kinds of wildlife, such as prairie dogs, other types of rodents, and birds which are adapted to an open grassland type of habitat are also present.

Both elk and deer winter on either side of the valley. The Fish and Game Department owns a winter range area southeast of Ratio Mountain on the west side of the valley. Deer and elk have been observed wintering in this area as well as on Bull Mountain on the east side of the valley.

Wintering deer have also been observed in the lower reaches of Beaver Creek about 4 miles from Boulder. Some use is made of the Whitetail Pass area for wintering purposes during mild winters. A small number of elk migrate from both the east and west sides of the valley via Whitetail Pass. The pass probably serves as an escape route for elk during hunting season, and may be significant for certain time periods for this reason, as well as for normal seasonal migration.

II. EFFECTS ON WILDLIFE RESOURCES

A. Basin Route

The major effect on wildlife will be the destruction of wildlife habitat from construction activities, the loss of area taken for the highway lanes, access roads and interchanges, the land between the lanes, and the land required for the stock drive line. While some vegetation may be preserved where split alignments occur, this will be essentially unavailable for most wildlife use. Much of this vegetation is of varying importance to sustain wildlife, especially moose, during severe winter periods.

Small game, furbearers, and nongame species of wildlife will also suffer from the loss of this habitat.

Road kills of deer and occasionally elk are common in narrow, winding canyons. There will be an increased hazard to deer and other wildlife due to the wider expanse of road to cross, plus faster highway travel. Better visibility will help to alleviate this problem, but in total more road kills will probably result.

There is not a large seasonal migration of game animals which crosses the present two-lane highway. Since elk and deer winter on south slopes on both sides of the Boulder River and Bison Creek, localized movements occur. A fenced four-lane highway will interfere with these movements.

Correspondence with game departments in neighboring states indicates that, generally speaking, interstates do not form impassable blocks for elk migration. In addition, there are some indications that individual elk have become accustomed to the high sound levels associated with highway travel. However, since elk normally avoid human contact, there would be generally adverse effects on the elk population.

Loss of access to hunting areas along this route would also be an adverse impact. Some areas now readily accessible will become very difficult to reach. The significance of this loss on wildlife populations, per se, is unknown.

B. Nez Perce Route

Since this proposed route is located through an area which is primarily summer range for wildlife, the loss of land area used for construction and the loss of browse vegetation is not as critical as the loss of wintering range. Game animals are normally dispersed in summer over a wider range and do not congregate in specific key areas.

There is probably little seasonal migration of game animals across this route except perhaps in the lower two miles of the Little Boulder River drainage. The major portion of the route follows a general northeast-southwest direction. The area to the south of the route is north slope and heavily timbered. There is thus little reason for migration from the south-facing slopes on the north side of the proposed route to this timbered area. Some movement occurs on a localized basis between feeding areas on south slopes to cover on north slopes.

With the above exceptions, the effects on wildlife would be similar to those discussed on the Basin Route. Generally speaking the area through which this route is proposed is essentially undeveloped and thus provides a less disturbed habitat for elk and other wildlife. An interstate highway through this area would disrupt these generally favorable conditions.

C. Whitetail Pass Route

Some mule deer winter along the foothills in the northern-most section of this proposed route. These deer would be affected by the loss of wintering area. In addition, there would be an increased hazard of road kills of deer during winter and spring.

A more serious effect of this route on wildlife would be the possible interference with elk movement which occurs across the Whitetail Pass area. Since the pass area serves as an escape route for elk being hunted, added problems would be encountered. This would not be in the route blockage, per se, since elk have adequate room to flank pursuing hunters or will cross the highway if necessary. The danger of collision with highway traffic, however, would be greater by an elk being pursued than with a normal migrating or feeding animal. This may result in public requests for elk-proof fencing.

If only small numbers of elk migrate across the pass seasonally, and these elk can and do cross the highway, the highway would not have a significant impact on elk herd size. On the other hand, if a large number of animals normally migrate, summer and winter ranges on both sides of this alternate route may not be adequate if migration routes are blocked. This would necessarily result in a reduction of herd numbers.

Most of the route is located through open grassland. With the exception of effects on the antelope herd which resides in the valley, the effect on wildlife through this area would be less significant than in the Basin or Nez Perce Routes because the habitat is more homogeneous.

The antelope range will be divided by the road, possibly separating winter and summer game range. This is important because antelope cannot pass through or over standard-design interstate fences. They also tend to avoid crossing highways. These problems could be alleviated by other fence design or underpasses as local conditions dictate, e.g., sheep-proof fences may not be required. Some adverse effect may be reduced by changing the final location of the highway in the valley.

Other game, nongame, and furbearers would be affected as described under the Basin Route Section. However, since the grassland habitat type generally does not support the quantity and diversity of wildlife species found on stream bottom habitat types, the net loss would be less.

III. DESCRIPTION OF EXISTING STREAMS AND FISHERIES

A. Basin Route

The Boulder River and Bison Creek are the main streams which will be affected by this project. Most of the tributaries contain similar fish populations, and some will be affected by road crossings.

Wild populations of rainbow, brook, brown and cutthroat trout and whitefish are found in the Boulder River and Bison Creek drainages. The streams are both easily accessible for fishing and are open almost in their entirety for public fishing and use. Catchable-sized hatchery rainbow trout are stocked in both streams to augment naturally reproduced fish. The physical fish habitat and water quality of these streams have been degraded by past stream alterations, mining, and other activities of man. Past disturbances of both streams have reduced the potential for maximum fish populations from levels normally expected in mountain streams of this type. For example, water quality data collected in 1971 indicate that drainage from some mined areas now pollutes some tributaries and the Boulder River to levels which inhibit fish food production, reduce fish growth, reduce spawning success, and in general create less than optimum conditions for aquatic life.

Some metals from abandoned mine drainage are present in the main Boulder River in amounts which have been reported to cause avoidance reactions to migratory fish, thus blocking existing or potential spawning runs from downstream. These areas would also be essentially devoid of resident populations of trout.

An important point to add concerning water quality is that to a large part these problems are correctable.

Channel alterations from road and railroad construction which have occurred in the past have also resulted in reducing the maximum potential for trout populations. Vegetation has recovered over the past several years, and has probably alleviated to a minor degree some of the adverse effects of channel straightening by providing overhanging cover.

B. Nez Perce Route

Two streams are involved in this alternate route. The Little Boulder River and Nez Perce Creeks are essentially in the pristine state with the exception of some possible effects of road construction and mining on the Little Boulder.

The Little Boulder provides fishing for rainbow, cutthroat, brown trout and brook trout in various sections of the stream. The stream now sustains a thriving wild fishery.

Nez Perce Creek is a small stream and probably serves only as a nursery stream for small trout at present.

C. Whitetail Pass Route

Streams involved on the Whitetail Pass Route are Beaver and Little Whitetail Creeks. Beaver Creek, tributary to the Boulder River, is a small stream, and to our knowledge does not provide any fishing. It probably serves as a spawning and nursery stream for small trout which may eventually migrate to the Boulder River.

Little Whitetail Creek on the south side of Whitetail Pass contains brook, rainbow, cutthroat, and brown trout, but again does not serve as a fishery of any importance. Tributary streams to be crossed contain small trout and have limited fishing use. The entire stream system is essentially free from adverse effects from man's past activities.

IV. EFFECTS ON STREAMS AND FISHERIES

A. Basin Route

As previously described, fishing in the Boulder River is limited due to past neglect by developers in protecting the physical stream habitat and water quality. The most serious effect on the fishery in both Bison Creek and the Boulder River will be the added adverse impact on both of these factors, plus the loss of channel length. Even though great care is taken in planning and construction, a serious amount of unavoidable damage will occur.

The effect on water quality during the construction period will primarily be from sediment, both in the suspended and deposited state. Even with every precaution, channel changes cannot be made without severe sedimentation and the resultant probable loss of aquatic insects and, depending on the degree and duration of sedimentation, the loss of fish. These losses may be in the form of direct mortalities, indirect mortalities or movement from the area.

Considering the extent of required channel changes on this route, it is assumed that the degree and duration of sedimentation will be severe. The effects on aquatic organisms will also be severe.

The time required for the recovery of the aquatic population depends on the severity and duration of sedimentation. Heavier particles of sediment will deposit in the streambed and, contrary to popular belief, do not "wash out" during normal runoff periods. This sediment will fill spaces between rocks where aquatic organisms live and destroy the potential for insect, i.e., fish food, production. This factor probably accounts in part for the less than optimum natural populations of trout now present.

With the several channel changes and shortened total channel length, stream hydraulics will be radically altered. Increased erosion and change of channel following construction may result from this change in hydraulics unless extensive bank stabilization measures are taken. This, though, often results in an artificial, unaesthetic, unappealing and unproductive stream.

The loss of existing vegetation, particularly that which furnishes fish cover, will further limit the potential for fish populations. Overhead cover in streams the size of Bison Creek and the Boulder River is of paramount importance for maintaining successful fish populations and fishing.

There is also a distinct possibility that metals which were deposited in the stream during the days of active mining and are still present to some degree in bottom sediments will be released into the water. Depending on the chemical form these metals are in, a serious fish kill or series of lesser kills may result. While specific conditions and the amount of time elapsed differ, a serious kill from a similar cause has been documented by this Department.

The existing open access to the streams would be severely reduced. The effect this may have on fishing pressures and the demand for continued supplemental planting of catchable-sized fish would depend on the accessibility to the stream following interstate construction.

The stock trail proposed to drive 4800 head of stock from Boulder to Bernice will provide some access for fishing and other uses. There are sections, however, as at mile 158, where there does not appear to be any room for a trail. It appears that part of the trail may be in the Boulder River itself, or immediately alongside. In either case, streamside vegetation and banks in this area would probably be destroyed. Loss of cover for fish, loss of root systems which stabilize undercut banks, and destruction of streambanks by the physical trampling are some adverse impacts which may result in certain areas. Fencing may alleviate this condition, but while specifics are not yet available, in certain tight areas fencing may not be possible.

A benefit which would result from the necessity for channel realignment would be the restoration of certain sections of Bison Creek and the Boulder River to old channel meanders. This is possible on Bison Creek primarily because of the removal of the railroad from Basin to Butte which initially made many of the existing channel changes. Proposed changes now amount to the net addition of 600 feet of Bison Creek channel. This total amount is not necessarily all benefit, even though on the surface it may appear to be. For example, if an altered section of the stream is now well vegetated with undercut banks and it is necessary to divert this to an old channel which now has no vegetation, undercut banks, pools, etc., there may be a net loss from the change for many years. Each section and change needs to be evaluated separately to determine if the result is beneficial or adverse. However, replacement of streams back into old channels is generally desirable.

On the Boulder River there is a net loss of 890 feet of channel length. Because of the difference in stream size and fishery potential, a net gain in distance on Bison Creek cannot be equated with a net loss in distance on the Boulder River. In fact, the loss of 890 feet of Boulder River is a serious adverse environmental impact.

Not the least adverse impact which will result from this alignment, although not a primary impact, is conflict with Montana's Stream Preservation Act. The Montana Fish and Game Commission is charged with providing an alternative plan or recommendation to the highway construction agency which will eliminate or diminish adverse effects of construction or hydraulic projects. This is normally accomplished by meander construction, development of fishing access areas, or other mitigative measures designed to equalize loss with benefits. On the Basin Route, because of the narrow canyon and the several facilities which must be maintained or constructed in the canyon, it is questionable that area needed for mitigative measures to maintain the status quo of the present stream is available.

The extent of use of tributaries by fish from the Boulder River for spawning purposes is unknown at this time. Normally, this use would exist and it is assumed that some tributaries do serve migrating fish. The state of the art of culvert design to insure passage of migrating fish is not yet entirely certain so there may be some adverse effect on fish migration by stream crossings.

B. Nez Perce Route

Since little development along this route has occurred in the past, Nez Perce Creek is in an essentially pristine condition. Since the stream is small and is located at a high altitude, it provides little if any fishing.

The Little Boulder River does provide fishing and there would undoubtedly be substantial adverse impact depending on alignment and construction activities. Sufficient information on this proposed alternate is not available to discuss specific impacts. Comments related to sediment pollution, channel straightening, etc., made in the Basin Route Section apply to the Little Boulder River also, but to a lesser degree because of its lesser inherent fishing potential.

There would be little benefit to fisheries to be gained from construction on this route, since the area's fishing potential is small.

C. Whitetail Pass Route

Since to our knowledge there is little fisheries use or potential on this route, there would be essentially no fishery impact. Fish passage problems and loss of nursery areas may occur, but since tributary crossings would be at right angles, this would be deemed insignificant in light of available information on this route.

Again there would be little benefit to be gained for fisheries in this area by interstate construction. Comments related to habitat and pollution also apply where the streams are affected, but again would be deemed insignificant.

V. DESCRIPTION OF EXISTING RECREATIONAL RESOURCES

A. Basin Route

Recreational activities, in addition to hunting and fishing, in the highway corridor include swimming, picnicking, camping, hiking, nature study and related outdoor experiences, by both resident and nonresident travelers.

Hunting for big game and game birds occurs in the Boulder River and Bison Creek floodplains as well as the surrounding hillsides and stream bottoms. Fishing occurs in both Bison Creek and the Boulder River. Opportunities for camping are available at developed U.S. Forest Service campgrounds and at numerous undeveloped sites along both streams. Both streams are clear at most times of the year and are of the typical cascading mountainous type.

The entire corridor is one of varied, scenic beauty. The present highway winds up the canyon between walls of rock outcroppings which form interesting rock formations, e.g., Indian Head Rock. Hillsides are primarily vegetated with connifers or sagebrush and grass covered on south slopes.

The corridor has abundant evidence of early Montana history. Several abandoned mines and buildings attract the interest of travelers passing through the area. At Bernice, one of the first Forest Service ranger stations in Montana still stands, as well as buildings associated with an old mining town and stage coach station. Other points of historic interest along the route which contribute to recreational use in the area are the historical town of Basin itself, the old stone house, and abandoned mines and mills in the area.

B. Nez Perce Route

This alternate route is now accessible only by an undeveloped road and receives only a fraction of the recreational use which occurs on the Basin route area. Hunting for big game is an important recreational use, but fishing is limited. One developed campground is provided by the U.S. Forest Service for camping and related recreational pursuits.

C. Whitetail Pass Route

This route is presently accessible by graveled county road. The major recreational use of the area is hunting of big game and game birds. Fishing is essentially nonexistent. There are no campgrounds or other developed facilities for public use. There is a limited amount of snowmobiling that occurs in the winter months in the immediate vicinity of the Whitetail Pass area. Approximately 16 miles of this alternate route is in open grassland terrain which provides little opportunity for recreational development.

VI. EFFECTS ON RECREATION

A. Basin Route

A severe loss in existing recreational opportunities and the loss of much of the potential for future recreational opportunities will result from interstate construction along this route. Some recreational development could occur in conjunction with highway construction, but the presence of an interstate will completely change the character of the canyon area and types of recreation suited for such an area. The random recreational experience now available to the highway traveler will be changed from one of impulse to stop anywhere in the corridor at a point of interest to one of a necessarily planned stop at a developed rest area, campground, or interchange.

Fishing and hunting are important recreational pursuits which now exist in the corridor. Effects on these activities have been discussed above. From a recreational point of view, the loss of access to areas for hunting and fishing will be a serious adverse effect on the existing recreational uses in the canyon area.

Other uses which occur at locations other than presently established campgrounds will be severely curtailed due to destruction of some of the areas now suitable for picnicking, camping, nature study, and related uses. Access to areas not destroyed will be severely reduced.

There is presently opportunity for cabin site development along private sections of land in the corridor. This potential use of land will also be reduced by a severe degree.

Some areas which have historical interest to the traveling public will be eliminated. For example, evidence of old mining activities in Basin. Some may consider this a benefit of the project, but it must be recognized that such sites are points of historic interest to the resident and nonresident traveler.

The pond at Elk Park Inn was reportedly used for an ice supply by the railroad during early Montana history. This attractive and historic pond is in the direct path of the proposed highway.

The most serious adverse impact of the interstate along this route would be the irretrievable loss of recreational values associated with a large, scenic area near population centers of Montana. This area has tremendous potential for providing outdoor recreation in the present and future. The corridor is ideally suited for the concept of recreational roads. This concept originated and was brought to reality in this State in Wolf Creek Canyon.

There is little doubt that recreation-oriented development of the area would benefit the area's economy over a longer period of time than interstate construction, as well as retaining much of the scenic and recreational value of the corridor. Development of this type could very well complement an interstate system by providing an alternate unhurried route to a common point for travelers driving for pleasure.

B. Nez Perce Route

An interstate along this route would have little impact upon present recreation other than fishing and hunting, which has been described above. Other recreational use is now limited. Access to the one established campground on this route would undoubtedly be retained.

With the exception of possible recreational use for camping, picnicking, and associated uses in the lower section of the Little Boulder River, little recreational use is made of this area. Some benefits to recreation could be developed in conjunction with interstate construction, e.g., providing better access to the area for hikers, cross-country skiers, etc. Such developments would, of course, have adverse impacts by significantly destroying the wild character of the area and on other segments of its natural environment.

C. Whitetail Pass Route

As on the Nez Perce Route, recreational use in this area is primarily in the form of hunting and fishing. There may be some use of the Beaver Creek drainage for camping or picnicking, but this would be minor.

Since most of this route lies in open grassland terrain, there appears to be little chance for general recreational opportunities.

NORTH BOULDER RIVER INTERSTATE CORRIDOR

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From Mont F&G

I. Description of Existing Wildlife and Range

North Boulder River Route

The habitat associated with a highway corridor from Boulder, approximating the location of FAS Route 281, to Interstate 90 near Cardwell is primarily dry, open grassland. Foothill terrain is encountered for a short distance immediately south from Boulder.

Antelope are the primary big game species associated with the area throughout the Boulder highway corridor. The antelope are most prevalent on the southern part of the Boulder Valley, the major population found east of the existing FAS Route 281. Assuming that a new highway would be located on or west of the existing route, little opportunity exists to encounter mule deer habitat, except for the area immediately south (4 miles) from Boulder. Other kinds of wildlife including various rodents and birds adapted to the grassland habitat are also present.

II. Effects on Wildlife Resources

North Boulder River Route

The major effect on wildlife will be destruction of habitat that results from actual construction, the loss of area taken for highway lanes, access roads, and land between lanes. An improved high speed road of any kind increases opportunity for vehicle contact with wildlife. Antelope rarely cross high standard roads, likely the existing route is sufficient to prevent their crossing freely.

Because of the dry, grassland habitat lacking capacity to support a large quantity and variety of wildlife, the Boulder route would have much less impact on wildlife resources than would the Basin Route, the Nez Perce Route or the Whitetail Route. The net loss in terms of wildlife resource would be considerably less than the other three alternatives.

III. Descripton of Existing Streams and Fisheries

North Boulder River Route

The North Boulder River is the main stream that would be affected by a highway alignment through this area. Presumably the route would be on the west side of the river. This route would also cross the Little Boulder somewhere near the confluence with the North Boulder.

The North Boulder supports a good population of wild trout. Brown trout is the dominant species with rainbow trout, mountain whitefish and brook trout also present. The North Boulder flows through an agricultural valley and intensive use of the immediate floodplain has adversely affected game fish habitat. However, the stream still provides a significant fishery and this could be improved with the application of floodplain management. Fish habitat in this portion of the stream may also be adversely affected by the physical and chemical problems that exist upstream from the town of Boulder.

IV. Effects on Streams and Fishing

North Boulder River Route

This valley is relatively wide and a route could be selected that would not be in close proximity to the stream. Some encroachment might occur in the area immediately south of the Little Boulder but mitigative measures could resolve this problem.

Current fishermen access on the North Boulder is limited to the bridges on public roads and to those private lands where access is permitted. There has been an application for a Small Watershed Project (PL566, SCS) pending on the Little Boulder for several years. The proposed project includes downstream fishery benefits that would primarily benefit the North Boulder. The utilization of any potential enhancement would require an improvement in the access situation. Therefore, the fish and wildlife report on this project included a recommendation for acquisition of several access and parking areas and a foot easement between these points. The project is inactive at this time so it is not known if or when the project might be carried out.

Assuming that the alignment was not in close proximity to the North Boulder, this route would have little adverse affect on the fishery resources. Influence on fishery values would be comparable to that of the Whitetail Pass route and less than the impact on the Nez Perce or Basin Routes.

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SECTION V

SOCIO-ECONOMIC STUDY

MONTANA DEPARTMENT OF HIGHWAYS

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Page

SECTION V - SOCIO-ECONOMIC STUDY

REGIONAL DESCRIPTION OF IMPACT ZONE AND LOCATION OF SOCIAL-ECONOMIC-CULTURAL CENTERS ---------------------- 333
ECONOMIC IMPACTS ON COMMUNITIES
    Butte's Culture and Economy ---------------------- 336
        Social and Economic Impact on Butte by Alternate Corridors ---------------------- 339
    Basin's Culture and Economy ---------------------- 340
        Social and Economic Impact on Basin by Alternate Corridors ---------------------- 342
    Boulder's Culture and Economy ---------------------- 343
        Social and Economic Impact on Boulder by Alternate Corridors ---------------------- 345
    Helena's Culture and Economy ---------------------- 346
        Impact on Helena by Alternate Corridors ------- 347
ECONOMIC IMPACTS BY CORRIDORS
    Basin Route's Economic Systems -------------------- 348
        Impact on the Basin Corridor Economic Systems by Alternates ---------------------------- 353
    Nez Perce's Economic Systems --------------------- 354
        Impact on the Nez Perce Corridor Economic Systems by Alternates---------------------- 358
    Whitetail Pass's Economic Systems ----------------- 359
        Impact on the Whitetail Pass Corridor Economic Systems by Alternates ------------- 362
    Boulder Valley's Economic Systems ---------------- 363
        Impact on the Boulder Valley Corridor Economic Systems by Alternates --------------------- 366
        Land Ownership Map -------------------------- 368 & 369
TAXABLE VS. NON-TAXABLE LANDS BY CORRIDOR -------------- 371
    Agriculture Map ---------------------------------- 372 & 373
SOCIAL IMPACT BY CORRIDORS
    Social Systems of Basin Corridor ------------------ 375
        Impacts on Basin Social Systems -------------- 378
    Social Systems of Nez Perce Corridor -------------- 378
        Impacts on Nez Perce Social Systems ----------- 379
    Social Systems of Whitetail Pass Corridor ---------- 379
        Impacts on Whitetail Pass Social Systems ------ 380
    Social Systems of Boulder Valley Corridor --------- 380
        Impact on Boulder Valley Social Systems ------- 381
SUMMARY & CONCLUSIONS ---------------------------------- 383
APPENDIX TO SECTION V ---------------------------------- 386 to 398
REFERENCES --- 399 & 400

PARAMETERS OF THE STUDY

AUTHORITY AND RESPONSIBILITY

Location and design of highway facilities within the State of Montana are the responsibility of the Preconstruction Section of the Department of Highways. The Preconstruction Section requested and received approval to utilize expertise available within the Department for an in-depth study of the economy and sociology of the impact area. This responsibility was assigned the Right of Way Section of the Department of Highways.

COORDINATION WITH OTHER DISCIPLINES

The Department of Highways, as the lead agency, contacted all appropriate federal, state, county and city agencies, business firms, institutions and private individuals for information and input. All information was distributed to the other departments for evaluation and "feed-back." Pertinent social and economic data was also received from the consulting firms for evaluation, assembly and assimilation into the following text.

ASSUMPTIONS AND/OR LIMITING CONDITIONS

Following are assumptions and the limiting conditions under which the social and economic study was conducted:

> PLANS - Field work was conducted from aerial photos, sketches, county maps and the U.S.G.S. quadrangles with proposed alignments and public access facilities superimposed as they appear in the Draft Environmental Statement. Design details were not available so right of way requirements were estimated, based

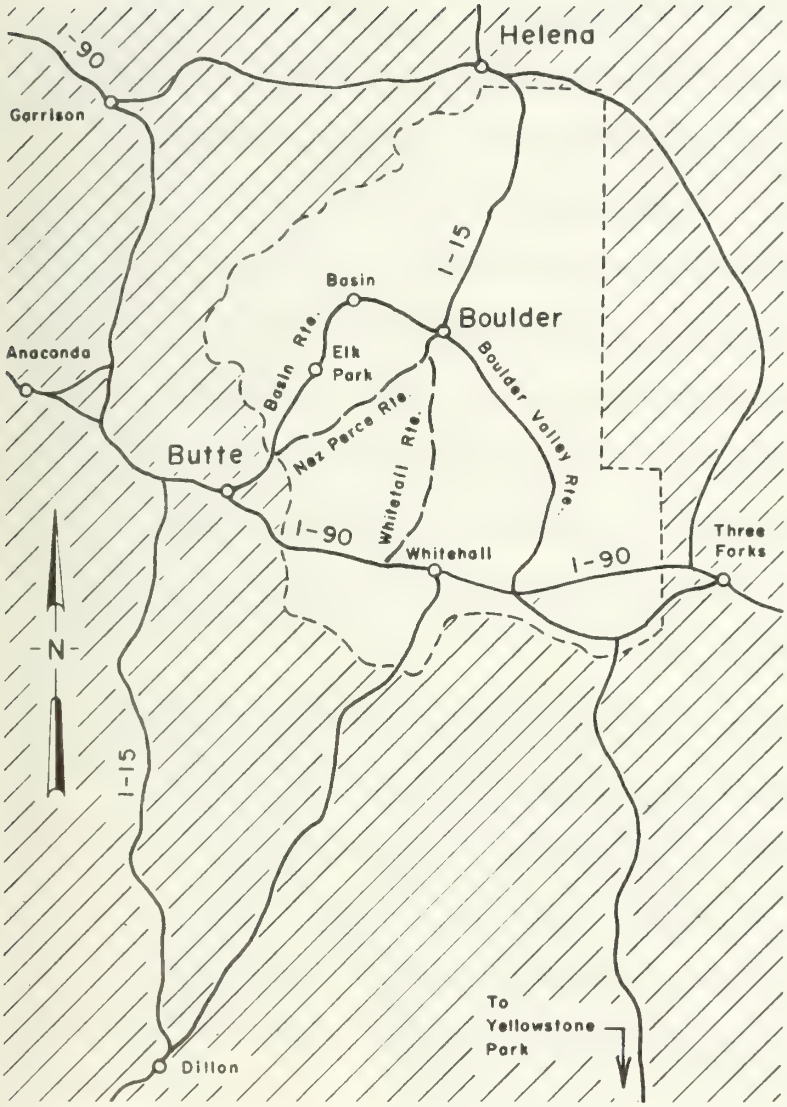
on similar conditions in similar areas.

TRANSPORTATION - Highways and roads in the non-selected corridors will remain and be improved as time demands.

TRAFFIC STUDIES & PROJECTIONS - This report is based on the traffic study shown in Section 2, Phase II.

TITLE - It is the policy of the Department of Highways to take fee title to all rights of way exclusive of mineral rights. Through publicly owned lands special use permits and/or easements are acquired.

ECONOMIC MINERAL DEPOSITS - It is beyond the scope of this report to attempt to evaluate the qunatity and quality of economic mineral deposits in this region.



Regional Impact Zone and Economic Centers, Jefferson County. . .

REGIONAL DESCRIPTION AND LOCATION OF SOCIAL - ECONOMIC - CULTURAL CENTERS

The area of impact from the proposed construction of Interstate 15 in western Montana extends from Butte to Helena in a northerly-southerly direction and from Anaconda to Three Forks in a westerly-easterly direction. Economic and social effects of the final location of Interstate 15 may be detectable as far north as Great Falls and as far south as Dillon, Montana.

The principal industries of this region are mining (Butte), government (Helena), agriculture (Boulder & Whitehall) and recreation-tourism. Of notable social importance are state hospitals (Warm Springs & Boulder), museums (Butte & Helena), colleges (Butte & Helena) and other public and private services and facilities found in cities and towns comparable in size and location.

The Butte-Helena region lies near the center of the heavy concentration of the State's economic life. Unofficial sources* show that 65% of population and 90% of the payroll can be found within a 125 mile radius of Helena.

This region should continue to experience economic growth in recreation and a more intensive development of agricultural lands. Mineral discoveries could substantially alter the current economic and social trends in the area. Economic indicators for Jefferson County, the predominant governmental subdivision of this region, show moderate economic growth during the 1960-70 decade. The recent Overall Economic Development Program (1), a study of Jefferson County prepared for the Rocky Mountain Development Council, summarized their findings as follows:

> "In spite of its problems and deficiencies, Jefferson County has sufficient potentials for growth to cause some optimism. The natural beauty of the area and its capabilities for all kinds of outdoor living make it a very desireable place to live, work, and play. The area will continue to develop as the bedroom and playground for Butte and Helena."

ECONOMIC IMPACTS ON COMMUNITIES

The following quotations were taken from the study, Effects of Highway Bypasses on Five Montana Communities, prepared by Bureau of Business and Economic Research, at the University of Montana.

Cascade, Montana . . . "Cascade's economy undoubtedly has slumped since the town was bypassed, especially the highway-oriented business. Without the construction activity which temporarily stimulated it . . . "

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* Informational Leaflet, Helena Chamber of Commerce, 1973

(1) Overall Economic Development Program, Jefferson County, R.M.D.C., 1972

Superior, Montana . . . "In short, highway-oriented businesses were hurt by bypassing Superior. In part, some have adjusted by relocating. Meanwhile the community as a whole has continued to grow and prosper."

The same general result (loss of retail sales) are reported by the Highway Research Board (HRB) for towns under 5,000 in population as follows: Total Retail Sales (-6.6%), Highway-Oriented Sales (-10.3%), Service Stations Sales (-13.6%), Restaurant Sales (-22.8%), Motel and Hotel Sales (-43.8%), and Non-Highway-Oriented Sales (-12.6%). Research (pages 206 and 207 H.R.B. Report 122)on bypasses, reveal "that places of 5,000 and larger have a somewhat better chance of adjusting to economic changes than by smaller communities. Highway-oriented businesses i.e., those providing fuel, food and lodging for transients were most seriously affected." This same report also found "it is probably a safe conjecture that bypassed towns within 15 to 25 miles of larger ones along the same highway element suffer substantially. Conversely, the larger or more centrally located communities along the transportation system are probably substantial beneficiaries of highway improvements, even though bypassed, this benefit being at the expense of their smaller sister cities."

Other valid general conclusions in the H.R.B. publications, are that land values tend to increase as a result of improved highway facilities. Changing land use can also be expected as commercial establishments compete for desirable locations, farms and ranches adjust, traffic patterns change, etc.

Other "before and after" Studies (See "References" at end of this Section) support these conclusions and imply that cities supported by local industries are not severely impacted by being bypassed.

BUTTE'S CULTURE AND ECONOMY

Butte, Montana, has a city limits population of 23,368 people and a metropolitan population of 40,657 (1970 census) located on the westerly slope of the continental divide. At an elevation of 5,500 feet and known as the "Richest Hill on Earth", the economy has evolved from and is principally dependent on the mining industry. The Anaconda Company, one of the largest mining companies of the world, own and operate the mining properties. Beginning from a single claim in the 1860's, it now produces over 200 million pounds of copper a year. Ore is processed at the Anaconda smelter (24 miles west of Butte), East Helena and Great Falls from where metal products and by-products are distributed nationwide.

Ore removal at Butte . . .

As a large community, Butte is an important regional marketing center for the Whitehall-Dillon-Deer Lodge-Boulder region. The region is served by the Montana Livestock Auction Sales Company. Other community services that are normally found in cities of similar size are available in Butte. Of particular importance culturally, are Butte's World Museum of Mining, Montana College of Mineral Science and Technology and Butte's Civic Center.

Once a thriving city with a population in excess of 100,000 people, the machine age and mining technology have contributed to the decline of Butte. Efforts to stabilize the economy and make Butte less dependent on mining are being aggressively pursued Designation of the new customs and warehousing facility of "Port of Butte," intensive promotion of food processing and distribution, winter recreation and tourism are part of this pattern. Population losses (33,251 in 1950, 27,877 in 1960 and 23,368 in 1970, in city limits; 43,530 in 1960 and 40,657 in 1970, metropolitan area) have resulted in part, in this promotion for diversification. Butte has two high schools and two junior highs and 19 elementary schools. Forty-seven churches conduct services in the Butte area.

Transportation systems have been, and will continue to be vitally important to the economic and social systems in and around Butte. Interstate routes 15 and 90 intersect near Butte. Mainline railroad service is provided Butte by Union Pacific, Burlington Northern, and the Milwaukee Road. In addition, the Butte, Anaconda and Pacific Railroad, a wholly owned subsidiary of the Anaconda Company, transports company products between Butte and Anaconda Northwest and Western Airlines offer eight flights into and from the city daily. Butte is also served by Western Greyhound, Intermountain and Burlington Northern bus lines.

Neither Butte nor Silver Bow County have a significant population of any minority races. Although Indians are the predominant minority race, less than one percent (0.9) of the State's total minority races are located in Silver Bow County. They are assimilated and scattered throughout the community. Negroes and other races in Silver Bow County total less than 0.3% of the State's minority population

Other Economic Considerations (Butte)

Transportation Related Industries - U. S. 91 between Butte and Helena is heavily used by many trucking firms - Consolidated Freightways, Burlington Northern Transportation Co , Garrett Freightways, Safeway Stores, U.S. Postal Service, Intermountain Bus Lines and many other local and cross-country truckers.

New industry generating in Butte is the Import - Export and warehousing facility of the "Port of Butte." Their first four months' operation involved handling of 25 to 30 containers of goods per month at 40,000 pound per container. Their break-even domestic (warehousing) service is 100 containers. To date (August 1973) their main transportation pattern is rail-in, truck-out with the out pattern primarily to the West. Negotiations are under way which could require doubling the warehouse facilities.[1]

Intermountain Bus Lines currently have three (3) round trip schedules serving Basin for passengers and package express. Their present operation makes connection with eight other passenger and express carriers. The 1971 total passenger-express trade carried between Butte and Great Falls on the

[1] Position & Policy Paper on Diverting of Interstate 15, Port of Butte, James R. Hodge, Ex. Director, 1973

bus lines were 66,291 passengers and package express totaling in excess of $100,000.

Safeway Stores have a warehouse in Butte that is a distribution point for this region of Montana. They estimate (Great Falls Tribune 5/21/73) increased costs of $17,000 annually if future developments require route changes to Whitetail or Boulder Valley.

The U. S. Postal Service point out that increased mileage would result in greater transportation time adversely affecting the time schedules in Butte and Helena. Presently, mail is hauled by individual truckers to and through Basin at an average estimated cost of $0.20/mile.

Other trucking companies oppose[2] the Nez Perce, Whitetail Pass and Boulder Valley routes because of the greater travel distances and unfavorable grades involved.

SOCIAL AND ECONOMIC IMPACT ON BUTTE BY ALTERNATE CORRIDORS

Basin Route - Short-term beneficial impact on retail trades, housing, services, finances and other businesses. . Social systems (schools, churches, medical facilities, etc.) adequate to absorb short-term increases. . . No displacement of people nor impact on minority groups. . . Long-term beneficial impact to traffic related industries, wholesale trades and general business community.

Nez Perce - Substantial short-term and long-term beneficial impact similar to Basin Route. . . Some truck traffic would continue through Basin and some traffic would continue to bypass through the Boulder Valley. No relocation of people or businesses nor impact on minority groups.

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[2] See Letter - Montana Motor Transport Association, Inc. dated June 29, 1972 in Appendix

Whitetail Pass - Less beneficial short-term impact on Butte businesses during construction. . . Need readjustment to northerly traffic pattern change. Adverse long-term impact effecting traffic related businesses, and wholesale trades due to increased traffic diversion. . . No significant change in social systems. . . No displacement of persons nor impact on minority groups. . .

Boulder Valley - Minor short-term benefit for businesses similar to Whitetail. . . Adverse long-term effect due to traffic diversion, as Whitetail. . . No displacement of persons nor impact on minority groups. . .

Conclusion - Basin Route appears to have least adverse and most beneficial effect on Butte.

BASIN'S CULTURE AND ECONOMY

Basin, Montana, an unincorporated community of 96 people (1970) is located seven miles westerly of Boulder in the Upper Boulder River Valley. This rural community supports two service stations, two bars, two cafes (one of which is seasonal), one year-around hotel, one laundromat and one general store, most of which are economically marginal - - - prospering during the tourist and hunting seasons and faltering in off-seasons.

Basin has a limited number of public utilities available but does have electrical and telephone service as well as a community water system. Plans are currently being developed for an improved water and sewer system which will replace the current supply and other private systems.

Income sources and the business community are dependent on traffic (tourists, truckers, salesmen, etc), local mining activities and residents. Many of the residents are employed out-side the community Basin is the site of Pacific Silica Company, a subsidiary of Union Carbide, which produces industrial and decorative quartz. A relatively pure source of quartz, it is mined by open pit methods, stockpiled, and shipped by rail and truck to consumers. The American Smelting & Refining Company uses this product in their smelter operation at East Helena. Basin is the center of a concentrated number of mining claims. (See location map HISTORY & ARCHEOLOGY Section IV)

Basin grade school provides local residents with an educational facility for children (34 students in 1973) through the sixth grade. Junior high and high school students are bussed to Boulder daily during the school term.

U. S. 91 through Basin. . .

U.S. Highway 91, which currently connects Butte to Helena and other cities, provides Basin and the westerly sector of the Boulder River with a good all-weather highway. Portions of U.S. 91 to the north of Boulder and southerly near Butte have been replaced by construction of Interstate Highway 15. A branch of the Burlington Northern railroad connected Butte and Helena through this canyon, but abandonment and removal of the rails has taken place from Elk Park to Basin. Service will be continued between Basin and Helena and immediately north of Butte. In addition to the private modes of transportation, residents rely on Western Greyhound buslines for public transportation, which is available to travellers twice daily from Basin. There is no air travel service in or near Basin. An airstrip is located near Boulder for small craft, but those wishing to use commercial air service must travel to Butte or Helena for regularly scheduled flights

Easterly of Basin approximately one-half mile, Montana Power Company has constructed and operates an electrical substation. This is the source for local electrical servcie lines in Basin and rural areas. With the planned interchange east of Basin, relocation of this facility would be required as would portions of the twin 110 KV lines that carry power to and from this station.

SOCIAL AND ECONOMIC IMPACTS ON BASIN BY ALTERNATE CORRIDORS

Basin Route - Short-term beneficial impact on retail trades and local services during construction . . Schools, housing and other services inadequate for significant increase in population during short-term. . . will require relocation of five (5) families. . . decent, safe and sanitary housing would be made available through relocation assistance programs. . . No minority groups would be affected. . . Long-term economic losses expected, due to traffic bypass. . . Long-term community growth due to commuter trends

Nez Perce - No significant short-term impact-less minor pressures on school system and housing . . . No relocation nor impacts on minority groups. Adverse long-term impact on retail trades. . .

Whitetail Pass - No significant short-term impacts. Adverse long-term impact on retail trades, no relocation of persons, businesses nor impacts on minority groups.

Boulder Valley - No significant short-term impacts. Adverse long-term impact on retail trades and services. No relocation of persons, businesses nor impacts on minority groups.

Conclusion - Basin Route would have the least adverse effect on Basin

BOULDER'S CULTURE AND ECONOMY

Boulder, Montana, an incorporated city of 1,348 people (1970) located between Butte and Helena is the county seat of Jefferson County, the location of the Boulder River School and Hospital, Jefferson County High School and Boulder Grade School.

Boulder provides a city water system garbage collection, electricity, natural gas, telephone, police protection, volunteer fire department and recreational facilities. A small business district of four restaurants, three bars (liquor establishments), a bank, bowling alley and drug store serve the community. Legal, health and religious services and facilities are also available.

The Boulder River School and Hospital, a state owned and operated institution, is the primary source of employment in Boulder and lends economic stability to the community. In 1970 there were 760 patients and 138 employees at the institution. Secondary sources of income to the economy of Boulder originate from agricultural products. The capital return on products marketed outside the community are spent locally for food, fuel, equipment, services and entertainment by the surrounding farm-ranch operators and their families. County-wide estimates (3) of this resource were reported in 1969 as follows:

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(3) Overall Economic Development program, Jefferson County, R.M.D.C., 1972

> "Gross farm receipts have been increasing steadily. . . with 1969 marketings producing $3,634,100 and government payments adding $154,400. Livestock and livestock products generally account for about 80% of farm marketings with cattle the main livestock products."

Additional important components of the economic systems in Boulder are tourism, recreation, mining, and governmental activities. Significant amounts of "outside money" flow into the community seasonally from tourists attracted to the area by "health" mines, resorts (spas), the area mineralogy and the mountainous environment. Fall and winter recreation, hunting and snowmobiling also contribute to the economy seasonally. Currently, construction of Interstate 15 north of Boulder has made and is making a significant impact on the local economic and social systems.

Schools in Boulder provide educational opportunities on primary and secondary levels, grades 1 through 12 (nearing capacity-95% with 240 pupils in primary and 80% with 142 in High School) to the city and to Basin, Jefferson City, Clancy, Wickes and Elkhorn. Class rooms are available in Butte, Helena and Whitehall Elementary schools located in Basin, Clancy and Montana City are for grades 1 through 6 while high school students must be bussed to Jefferson County High School. Boulder does not have a community hospital, but emergency arrangements (8 beds) have been maintained with the state owned hospital to satisfy these needs. Religious services are conducted in two churches (Catholic and Protestant) weekly, and legal assistance and police protection are also available.

Due primarily to the Boulder River School and Hospital, there would appear to be a disproportionate number of minority races in Jefferson County. Of the 87 non-whites recorded (4), 38, or 44%, were patients of the institution. Jefferson County does not have a significant number of non-white races. With a total population of 5,238 people, less than 1% of the State's minority races are residents of Jefferson County. Like most Montana cities, minorities are scattered throughout the communities, with no identifiable concentrations or neighborhoods.

SOCIAL AND ECONOMIC IMPACTS ON BOULDER BY ALTERNATE CORRIDORS

Basin Route - Short-term beneficial impact to retail trades, services, and finance. . . Social systems and housing not adequate for significant short-term increases in population. . . No relocation of people or businesses nor impact on minority groups. . . Long-term adverse impact on tourist orientated businesses due to bypass. . . Long-term community growth accelerated by commuter trends.

Nez Perce - Short-term impacts same as Basin route. . . Long-term impacts similar to Basin route. . . Local travel westerly to and from the Basin area will inherit a lesser road way. . . No relocation of people or businesses nor effect on minority groups. . .

Whitetail Pass - Short-term impacts same as Basin route. . . Long-term adverse effects not as severe as Basin route due to traffic changing systems (I-15 to U.S. 91/State 281 U.S. 91/State 281 to I-15, etc.). . . Impact on social systems similar to Basin route. . . No displacement of people, businesses nor impact on minority groups. . .

Boulder Valley- Impacts similar to Whitetail Pass. . . No displacement of people, businesses nor impacts on minority groups.

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(4) Department of Commerce, Bureau of Census (1970)

Conclusion - Basin Route should proide a slight advantage to Boulder over the other choices.

HELENA'S CULTURE AND ECONOMY

Helena, Montana is a city of 22,730 people* (1970 census) located on the easterly slope of the Continental Divide. Nestled in a mountainous environment, it is the capitol city of Montana and the location of many federal, state and county offices. It is also a center for business, social and cultural activities serving the surrounding communities of East Helena, Unionville, Clancy, Jefferson City, Townsend, Canyon Ferry and rural areas. Helena's culture has evolved from the early gold rush days of 1864 into its present-day governmental-political society. Historical relics of the early mining days remain as visual reminders of the past and are of local and national interest.

State Capitol Building in Helena . . .

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* Within corporate limits

The principle industries, exclusive of state government, are agriculture, cement manufacturing, beverage bottling, dairy products, metal fabrication, warehousing, lead smelting and chemicals. Four commercial banks and two savings and loans serve the region with yearly bank debits of 1¼ billion dollars. A branch of the Federal Reserve Bank of Minneapolis is located in Helena.

There are 18 elementary, junior high and high schools located in and near Helena with thirty-two churches of various denominations available in the metropolitan area. In addition to the capitol complex, Carroll College, Veterans and Pioneers Memorial Building, Fort Harrison, Cathedral of St Helena and Reeders Alley are of cultural interest.

The capitol city is served by two U.S. Highways - Interstate 15 and U.S. 12. Burlington Northern Railway provides freight service. Greyhound bus lines, Intermountain Bus lines, Western and Northwest airlines provide public transportation to and from the city.

Lewis and Clark County does not have a significant number of non-white races. Only 2% of the State's non-whites are located in this area, and they are not concentrated in neighborhoods.

IMPACT ON HELENA BY ALTERNATE CORRIDORS

Basin Route - Insignificant short-term impact on businesses and social systems. . . Continuing long-term growth in Butte - Helena transportation related industries accelerated.

Nez Perce - Impact similar to Basin Route

Whitetail Pass - Insignificant short-term impact on economic and social systems . . Would inhibit normal growth of commerce between Butte and Helena.

Boulder Valley-similar to Whitetail Pass.

Conclusion - Basin Route would have some significant positive Impact on Helena.

ECONOMIC IMPACT BY CORRIDORS

BASIN ROUTE'S ECONOMIC SYSTEM

The economy of the Basin corridor had it's beginning with gold and mineral discoveries in the 1860's and has undergone a transition into agriculture and transportation in recent years. Mining, the principle attraction and industry of this earlier era, has steadily declined (5) and has been replaced in economic importance by incomes derived from recreational-transportational resources. Agriculture is an important element of the various economic systems at work in this area, but is restrained by the narrow valley bottoms, steep mountain slopes and heavy timber

There are three distinguishable economic sections through this corridor - Elk Park, Bison Creek and Bernice to Boulder. The southerly most extension (13 miles) of the Basin Route corridor is located through and across the high mountainous area known as Elk Park. This area is a broad (2 to 3 miles wide) mountain meadow, relatively timber free, with an abundance of natural spring water that produces excellent mountain feed for livestock. At an average elevation of 6,300 feet and bordered on the west by Rampart Mountain (7,800 ft)

RIGHT OF WAY REQUIREMENTS (BASIN ROUTE) BY OWNERSHIP, LAND TYPE AND USE*

	Agricultural	Mineral Claims	Residential	Industrial	Commercial	Other	Total
No. of Parcels	25	21	11	3	0	3	63
No. of Acres	680	56	4	4	0	449	1193

* From Woodville Interchange northerly.

(5) Overall Economic Development Program, Jefferson County, R.M.D.C., 1972, & County Business Patterns, Dept. of Commerce, Bureau of Census, 1970

and on the east by Whitetail Peak (8,500 ft.), this pass became a natural route connecting the Butte area with the Boulder Valley to the North. Currently U.S. Highway 91 and various public utilities are located through this pass and generally follow the Bison Creek Drainage to the Boulder River.

Woodville-Elk Park is the most significant agricultural sector* within this corridor. Ten agricultural units (three dairies and seven cattle ranches) are currently in operation producing dairy products and beef. Once an important dairy products source for the city of Butte, this activity has declined and has been replaced at more favorable locations and by modernization of dairies in Butte, Whitehall, Missoula and Bozeman. Production of feed grains has been unsuccessful due to the short growing season (May-September) and other climatic conditions. Beef producing operations are also limited and controlled by the high elevations, cool summer temperatures and early snows normal to Elk Park. There are only seven resident ranches with other units used as summer range by non-resident ranchers. Reliable sources estimate annual feed production of 30,000 animal unit months (AUM's) in the "meadow" area of Elk Park, exclusive of U.S. Forest Service grazing units.

Elk Park . . .

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* The Land Ownership and Agricultural plates on following pages.

Jib Complex. . Near Basin . .

Elk Park is becoming an important winter recreational area and popular summer home location. Subdivision of tracts is taking place, and homesites are in demand due primarily to its proximity to Butte and people's desire to"get away." This region was also active with sawmills during Butte's early days, but this activity has subsided and been replaced elsewhere by modern plants.

Immediately north of the Elk Park Sector are eight miles of the narrow Bison Drainage, with scenic rock outcrops, timbered slopes, brushy creek bottoms and live water. This sector terminates at Bernice where Bison Creek joins the Boulder River in a broad, lightly timbered valley. Bernice is located at the terminal of an improved county road connecting the Boulder Valley and Deer Lodge to the west. The Boulder River Valley westerly of Bernice is recreationally important and of historical interest.

The Bernice to Boulder sector, approximately 13 miles in length, is a historic mining area, which is centered primarily around Basin but also extends into the many gulches that drain into the Boulder River. Mineral exploration is sporadic - increasing and decreasing as a result of many and various economic factors. Open mine shafts, tailings, piles and deteriorating structures attract the curious and contribute to the character and economy of this sector.

Prior to the BN railroad track removal decision, making more space available, an engineering report by F M Young, submitted during preliminary corridor review pertains to the mining claims westerly from Basin. This study offered some mining values while examining the effects of two (2) alignment variations west of Basin, along the Basin corridor. The upper alignment would have traversed high on the hill to the north and caused minimal damage to mining interests, while the lower line essentially followed the P T W and would produce more damage to potential mining operations

There are twenty-one (21) mineral claims within the Basin Route corridor, only three of which show evidence of recent mining activity. Exclusive of the "health mines" and Pacific Silica Company, there is no evidence of continuous daily operations involving the extraction and transportation of ore by claimants in the Basin Route corridor. The Boulder-Basin (and Butte) region is underlain by a geologic phenomena known as the Boulder Batholith Batholiths are intrusions of molten material from the earth's center into sedimentary deposits of the earth's crust resulting in compositional and structural changes in the overlying formations. The physical limits of the batholith have been determined by geophysical exploration. (Report of structural Elements of routes by S.L.Groff, State Geologist, 3/12/73 and previous geology studies). Contact zones are common sources of economic mineral deposits, which is the key to this resource. Gold, silver, copper, lead zinc and manganese have been found in the placer and lode deposits of this region.

"Health mines" are commercial enterprises in the Basin Route area generally consisting of a chamber or shaft in radioactive roack. Purportedly, exposure to the level of radioactivity found in these chambers provides some degree of relief to persons suffering from such maladies as arthritus and rhumatism. Currently, there are five health mines in operation along this corridor, one of which has overnight accommodations for patrons.

Recreational activities contribute to the economy during the fall and winter seasons. Commencing in September, this region is a convenient area for hunting of deer and elk by local residents and hunters from Butte and Helena. Hunters and snowmobilers utilize the numerous campgrounds (6) in the area which are conveniently located to accommodate these and other types of outdoor activities.

Montana Power Company has two 110 KVA electrical transmission lines that generally follow this corridor. A local electrical distribution line and a Mountain Bell telephone line can also be found along the valley bottom.

Other Economic Considerations (Basin Route)

The Department of Highways recently purchased the Elk Park-Basin sector of the abandoned Burlington Northern Railroad branch that originally extended from Butte to Helena. This property would have been lost to the State, to another buyer had the purchase not been made at this time. Economically, this 190 acre acquisition will preclude costly railroad relocation and provide greater flexibility in design if this corridor is selected. If one of the other alternates is chosen, portions of this R/W can be utilized for future improvement of Highway 91.

The Department of Highways was actively acquiring right of way within the Basin corridor on Elk Park flats prior to cessation for re-evaluation of the environmental impact. Acquisition has been suspended on Interstate project I 15-3(16), Woodville - North, (Add 2) with 8 of 38 land parcels

(6) See "Description of Alternates" Phase 1, Section 1

acquired. Other significant acquisition by the Department of Highways was the Frazer Ranch (Sections 27 and 34, Township 6 North, Range 6 West), 200 acres of valley bottomland, and the Gunderson Truck Stop, both of which are within this corridor.

Sixteen ranchers from the Boulder Valley area trail cattle to summer range located in the various drainages of the Boulder River and Elk Park flats. It is estimated that the annual drives move from 4,800 to 5,000 cows to and from grazing areas in High Ore Creek, Galena Gulch, Cataract Creek, Basin Creek, Sullivan Gulch, Bernice, Bear Gulch and Elk Park. Ranchers contend this stockdrive practice dates back to the 1870's and is the most practical means of maintaining the productive capabilities of their operations. Cattle movements through the streets of Boulder and the community of Basin have caused controversy and conservationists are concerned about the stream bank and vegetation damages that result from these concentrated drives. Perpetuation of these livestock movements has been recognized as an economic necessity to the area and the problem extensively studied. Access planning has provided a continuous low standard road from Boulder to Bernice. Movements would be possible from Bernice to Elk Park via existing public roads and trails that would be perpetuated.

IMPACT ON BASIN ROUTE CORRIDOR ECONOMIC SYSTEMS BY ALTERNATIVES

Basin Route - Long-term annual loss of 65± AU (Animal Units year-long). . . Timber yield on 290 acres of medium to poorly stocked lodgepole pine (100 year life cycle). . . Land required from 10 placer and 11 lode claims with some impairment of access to others. . . Extensive utility relocation with possible secondary impact. . . No relocation of businesses. . .

Nez Perce - No significant impact on agriculture, mining or timber industries of Basin Route corridor. Minor adverse impact on "health mines"

Whitetail Pass - No significant impact on agriculture, mining or timber industries of Basin Route corridor . . Minor adverse impact on "health mines".

Boulder Valley - No significant impact on agriculture, mining or timber of Basin Route corridor. . . Adverse impacts on "health mines". . . (See preceding Economic Impacts on Communities).

NEZ PERCE'S ECONOMIC SYSTEMS

From the Woodville area north of Butte, the Nez Perce corridor passes through Sawmill Gulch, ascends the Nez Perce drainage area to Nez Perce Pass (elevation 7,420') and follows the Little Boulder River on a relatively steady downgrade into the Boulder Valley. Near its highest point Nez perce Creek originates and, with other drainages, flows southwesterly into Bison Creek.

The principle economic resources of the southerly sector of the Nez Perce corridor are recreation and grazing. This eight mile sector is located through the mountainous meadow of Elk Park, which is a broad expanse of timber-free grazing lands. Recreationally, this area is known for the international snowmobile track, B & B Fish Ponds, mountain summer homes, and as access to various elk hunting areas. The second sector of the Nez Perce corridor is twenty-one miles of national forest lands (Deer Lodge National Forest), sixteen of which are heavily covered with timber. On the northerly extreme near Boulder, the predominant economic system is again agricultural due primarily to the open foothills and abundance of water in the river valley. Currently there are no active commercial or industrial enterprises within the corridor with the exception of those in or near Boulder.

RIGHT OF WAY REQUIREMENTS (NEZ PERCE) BY OWNERSHIP, LAND TYPE AND AREA*

	Agricultural	Mineral Claims	Residential	Industrial	Commercial	Other	Total
No. of Parcels	10	3	8	(1)	0	3	24
No. of Acres	323	105	5	(60)	0	472	905

( ) Easement areas held by Utility Companies

Elk Park, as described in preceding portions of this study, is a mountainous meadow area used by resident and non-resident ranchers for summer range. Non-resident ranchers move livestock into this region in April and May to utilize their portions of the 16-20 thousand acres of grasslands that are available. There are approximately 16 livestock operations in the Elk Park area of which five use corridor lands. Due to the high elevations of this region, livestock is generally removed in October to avoid the heavy snows common to this region.

The foothills and bottom lands of the Little Boulder River provide longer seasons for the farm-ranch operators of this sector. Climatic and soil conditions in this area are not as favorable to feed production as is Elk Park, and the carrying capacity of the dry lands are lower. Irrigated lands along the Boulder River supplements the capacity with wet pasture and hay. The three private land operators within this sector near Boulder reside and operate year around Marketing and shipping centers for the agriculture products are Butte, Whitehall and Bozeman. There is also an extensive interchange and sale of feed and cattle between neighboring ranchers within the Butte and Boulder Valley areas

* From Woodville Interchange northerly to Boulder

Timber is the principle natural resource located within the Nez Perce corridor. Sixteen miles of the corridor length are through national forest which the U.S. Forest Service has classified (7) overstocked to well-stocked with the predominant species lodgepole pine. Other species present are minor stands of Douglas Fir, Ponderosa Pine and Larch. Merchantable timber is located adjacent to and within this corridor. Although there are currently no logging operations in this area, there is a 1974 timber sale of 500,000 board feet planned in the Crawley Dam area southwest of Boulder. Good access is currently available by dirt and gravel forest service trails on the mountain slopes south of Boulder. An improved forest and utility service trail is located through portions of the corridor which is traversible by four-wheel drive vehicle.

Other potential economic resources in and around the Little Boulder drainage are mining and recreation. Mining activity has been minimal due primarily to the mineralogy, terrain and remoteness of the area. There are 18 claims near the corridor which are not currently being worked with three inactive claims within the limits of the corridor. Structurally and lithologically, the geology is similar to the Basin area. Underlain by the

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(7) U.S.F.S., 1957 Timber Inventory

Boulder Batholith, the mineral composition and formations in this area are also similar.

International Snowmobile Track. . .

The annual International Speed Oval Snowmobile Championship Races are economically important to Butte and the surrounding area. This yearly event attracts snowmobile teams and enthusiasts from all parts of the nation and up to $15,000 in trophies and cash prizes have been awarded to contestants. This event makes a significant contribution to the winter-time economy of Butte. The B & B Fish Ponds, although less significant economically, are a popular spot for dog trials and sportsmen.

Constructed in the early 1900's and one of the first major transmission lines in this country, the Nez Perce corridor is the location of a 69,000 volt power line. This power transmission originated at "old" Canyon Ferry Dam and was built to furnish electricity to the Butte mines. Timber was cleared for the construction and maintenance of the facility and access road through this canyon.

Other Economic Considerations (Nez Perce)

Since 1963 several ranchers in the Boulder Valley, with and through the Soil Conservation Service, have been formulating plans to construct an irrigation storage dam on the Little Boulder River two miles south of Boulder. Utilizing the storage dam and a diversion canal from the Boulder River, it is planned to provide and improve irrigation water to 8,000 acres in the Boulder River Valley. The Boulder River Watershed Project boundary encompasses an area of 227,200 acres that is predominantly rangeland (54%) and woodland (43%). There are approximately 20 farm and ranch operators in the watershed area, managing about 400 acres of irrigated land per farm, below the planned structure on the Little Boulder River. Estimated cost (1963) of the proposed dam, river diversion structure, and reconstruction of 20 miles of canal was $1,437,500, with a cost benefit ratio of 1:1.4*. The proposed dam and impoundment would inundate 330 acres to a maximum depth of 88 feet and would make a significant contribution to recreation in the area. There are no other lakes or reservoirs of this size within 45 miles. Plans are proceeding on this proposed development with meetings and hearings scheduled. The proposed Nez Perce Corridor would parallel (8) the northwesterly water line of the reservoir

IMPACT ON THE NEZ PERCE CORRIDOR ECONOMIC SYSTEMS BY ALTERNATES

Basin Route - No significant impacts on the systems of the Nez Perce corridor

Nez Perce - Long-term annual loss of 10 AU. . . timber yield on 470 acres of well-stocked lodgepole pine. . . Land required from three mineral claims with impaired access to four others. . . increased recreational use extensive utility relocation. . . no relocation of businesses

Whitetail Pass - No significant impact on the economic systems of Nez Perce

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* Costs discussed in the Public Hearing of June 20, 1973 expressed the dam site and construction costs in terms of capacity e.i. 5,000 acre-ft dam would cost approximately $300 per ac-ft., 13,000 ac.-ft. at $150 per, and 25,000 ac. -ft. at $100.

(8) Soil Conservation Service, Letter dated 4-10-73

Boulder Valley - No significant impact on the economic systems of Nez Perce

WHITETAIL PASS ECONOMIC SYSTEMS

The Whitetail Corridor rises from the Jefferson River Valley near Whitehall on a gentle slope to a saddle in the ridge north of Bull Mountain, where it descends into the Boulder River drainage on the north. This corridor is 27.0 miles* in length, commencing west of Whitehall on its southern terminal and extending northerly to Boulder The southerly sector is approximately seventeen miles in length, with most economic and social systems oriented toward Whitehall. The northerly sector consists of three miles of the Boulder River bottomlands and seven miles of the northerly exposed slope of Bull Mountain

Agriculture is the principle and predominant economic resource of the Whitetail Pass Corridor There are no commercial or industrial enterprises within the limits of this corridor; however, a resort complex is located near the town of Boulder having property on this alignment.

Whitehall, an incorporated city of 1,035 people, is located five miles easterly of the intersection of Interstate 90 and the southerly extension of the Whitetail Pass corridor. Four motels, four service stations, three restaurants, grocery and department stores provide services and commodities to the City, tourist and the surrounding agricultural community. City services include water system, electricity, telephone, garbage collection and police force. Four churches conduct weekly services and medical and legal assistance is available.

* Does not include Butte - Whitetail Interchange sector

RIGHT OF WAY REQUIREMENTS (WHITETAIL PASS) BY OWNERSHIP, LAND TYPE AND AREA*

	Agricultural	Mineral Claims	Residential	Industrial	Commercial	Other	Total
No. of Parcels	12	0	0	(2)	1	5	18
No. of Acres	700	0	0	(0)		265	965

( ) Easement areas held by utility companies.

Within the limits of the Whitetail Pass corridor are five operating ranch units with an estimated sustainable carrying capacity of 1,500 cows. These ranches range in size from 9,000 acres to 500 acres, and make extensive use of B.L.M. and U.S.F.S. range. On the benchlands northerly of Whitehall the range is open, clears of snow readily and is easily managed. Soil conditions, the topography and low annual rainfall limit the productive capability of this slope, however. Creek bottoms, some of which are irrigated, do provide hay and winter shelter. Present access to the ranching area is by a gravelled county road that provides access to the communities of Whitehall and Boulder. It also provides access to the livestock and feed markets of Butte.

Timber is the second most important resource of this area. Currently, timber is being hauled from the Sage Creek area to sawmills in Whitehall. This thirty-thousand board feet harvest is nearing completion. Additional merchantable timber is located two miles northeasterly of Whitetail Reservoir. This planned sale of 1½ million board feet is an area predominated by lodgepole pine and spruce. Species common to the northerly slope of Bull Mountain are Douglas Fir, Ponderosa and Lodgepole Pine. The 1957 inventory classes sawtimber in this area as moderately to poorly stocked stands. On the northerly sector, the U.S. Forest Service and their timber contractors use this county road and a network of logging trails for their timber harvest.

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* From Whitetail Interchange to Boulder

Whitetail Pass. . .

Of lesser economic importance to the corridor are mining and recreation. There are no mining claims within or immediately adjacent to the Whitetail Pass Corridor. Five claims are accessible from various trails leading from Whitetail Creek road. Exploratory shafts, diggings, etc. are, however, evident in the area. Two miles southeasterly of Boulder is a well-known resort, popular statewide as a convention center. The Diamond S Resort offers lodging, dining, liquors and a hot-water pool to its patrons. Access to the establishment is from State Highway 281, which parallels the Boulder River.

Public utilities available within the corridor include electricity and telephone. Vigilante Electric Coop has a 7,200 volt line generally paralleling the Whitetail county road. Service extends northerly from the Whitehall area approximately 14 miles, as does Mountain Bell telephone service.

Other Economic Considerations (Whitetail Pass)

As described under the Nez Perce Corridor, the proposed Boulder River Watershed Project would occupy the lower reaches of the Little Boulder River. The dam site is tentatively planned in the north half of Section 9, Township 5 North, Range 4 West of Jefferson County. Adjustment within the corridor could be made to avoid the reservoir and dam site.

An irrigation canal proposal from Reichle Dam near Glen, Montana along the southerly slope of Bull Mountain would cross the Whitetail Pass corridor. The proposed Reichle Dam project on the Big Hole River would increase irrigable acreages in Silver Bow and Jefferson Counties in the Whitehall area.

IMPACT ON THE WHITETAIL PASS CORRIDOR ECONOMIC SYSTEMS BY ALTERNATES

Basin Route - No significant impact on the economic systems in Whitetail Pass.

Nez Perce - No significant impact on the economic systems in Whitetail Pass.

Whitetail Pass - Long-term annual loss of 35± AU. . . Timber yield on 200 acres of poorly stocked lodgepole pine   Continued nominal recreational use. . . Minor utility adjustments. . . Resolvable conflict with Boulder River Watershed Project. . . Significant short and long-term beneficial impact on retail trades, services, housing, finance and other businesses of Whitehall. . . no relocation of businesses.

Boulder Valley - Short-term and long-term benefits to Whitehall business community. . . No other significant impacts on Whitetail Corridor

BOULDER VALLEY'S ECONOMIC SYSTEMS

Boulder Valley . . .

The Boulder River flows into the Jefferson River approximately seven miles easterly of Whitehall and is the southerly most terminal of the Boulder Valley alternate (corridor). This corridor can be divided into two economic sectors - the southerly sector consisting of 16 miles oriented toward Whitehall, and the northerly 15 miles having Boulder as its economic and social center. Paralleling the river, this route, Boulder to I-90, is part of an alignment referred to as the "water level" route from Helena to Dillon and is the location of State Highway 281.

The predominant economic systems of the Boulder River corridor are agriculture and transportation. The broad "U" shaped valley, with its mountain slopes, river terraces and abundance of water, make it suited to the agricultural industry, particularly the raising of livestock. Forty percent of the total livestock cash receipts (1969) of Jefferson County are generated by livestock operations in the Boulder Valley. Minor monetary contributions to the areas economy are made by nearby timber and mining activities. There are no other significant commercial or industrial activities within the Boulder

Valley corridor.

RIGHT OF WAY REQUIREMENTS (BOULDER VALLEY) BY OWNERSHIP, LAND TYPE AND AREA*

	Agricultural	Mineral Claims	Residential	Industrial	Commercial	Other	Total
No. of Parcels	33	0	0	(1)	0	2	35
No. of Acres	1238	0	0	0		55	1293

( ) Easement area held by utility company.

Approximately 33 ranch units fall within the Boulder Valley corridor with an additional 15± units in close proximity. It is estimated that this valley sustains 10 to 15 thousand head of cattle, and from 5 to 9 hundred head of sheep year around. Ranches range in size from 10,000 acres to 500 acres, and in carrying capacity from 700 head downward. The river valley is the core of the operations with most ranch headquarters and winter feed grounds located near the river.

Ranchers in this area operate similarly to other mountain ranchers in western Montana. Winter feeding and calving are conducted in the sheltered river and creek bottoms. Cattle are then moved onto summer range in late April and early May. Most operators have grazing permits on U.S. Forest Service and B.L.M. lands in the nearby foothills and mountains. In the late fall, the cattle are returned to pasture and hay lands in the valley bottoms for "finishing out" and marketing. An abundance of water and the development of private irrigation systems along the Boulder River allows most operators to balance their units. In contrast to the higher area, sub-

* From Cardwell area to Boulder

stantial feed is produced on the irrigated hay meadows and wet pastures of the valley Soil conditions are superior in the northern sector of the valley near Boulder and tend to become poorer to the south. Expert sources (9) estimate the productivity capability of dry grasslands at 10 Ac/AUM, which improves to 5 Ac/AUM near Boulder Wetlands productive capabilities vary from 2 to 5 Ac/AUM

Principle livestock markets and shipping centers are located in Butte. As is common with all ranch communities, there are intra-area exchanges of feed and cattle between neighboring ranchers

Of secondary economic importance to the Boulder Valley corridor are mining, timber and transportation. Their importance is related to the existing highway facility and the service it provides their respective industries. To the east and west mining and logging operations are being conducted. Elkhorn (10), a mining community of 15 families, is located eight miles east of Boulder, where silver was actively mined until 1970, with ore hauled to Anaconda for processing. Currently, some mining activity is being conducted five miles northeast of Whitehall in the Sunlight area. There is no merchantable timber within the Boulder Valley corridor, but State Highway 281 is used by loggers hauling to Whitehall. Valley access is excellent over a paved all-weather state secondary farm-to-market highway. Southerly, state secondary route 281 connects to Interstate Highway 90 near Cardwell, and it joins with U.S. 91 at Boulder

Other recognizable systems that play a part in the economy of the area are recreation, tourism and the operation and management of public lands. Financial support for these activities are external to the area, but can be tied to current land uses as their source.

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(9) Field R/W Report, Grazing Capacity, dated 1973
(10) Field R/W Report, Elkhorn Access, dated 1973

Other Economic Considerations (Boulder Valley)

Jefferson County, with 5,238 people (1970) and encompassing an area of 1,652 square miles is adequately financed by current mill levies. Reports (11) state "The County and Town governments show a healthy financial condition according to the annual reports submitted to the State." Of the 1,059,000 acres in Jefferson County, 54.4% are National Forest lands, with another 10 to 15% non-taxable public lands. The Boulder River Valley corridor is predominently through private taxable lands, having the lowest percentage of public lands of the four corridors.

IMPACT ON THE BOULDER VALLEY CORRIDOR ECONOMIC SYSTEMS BY ALTERNATES

Basin Route - No significant impact on the systems of the Boulder Valley. . .

Nez Perce - A minor increase in truck traffic. . . And beneficial impact on businesses in Whitehall. . .

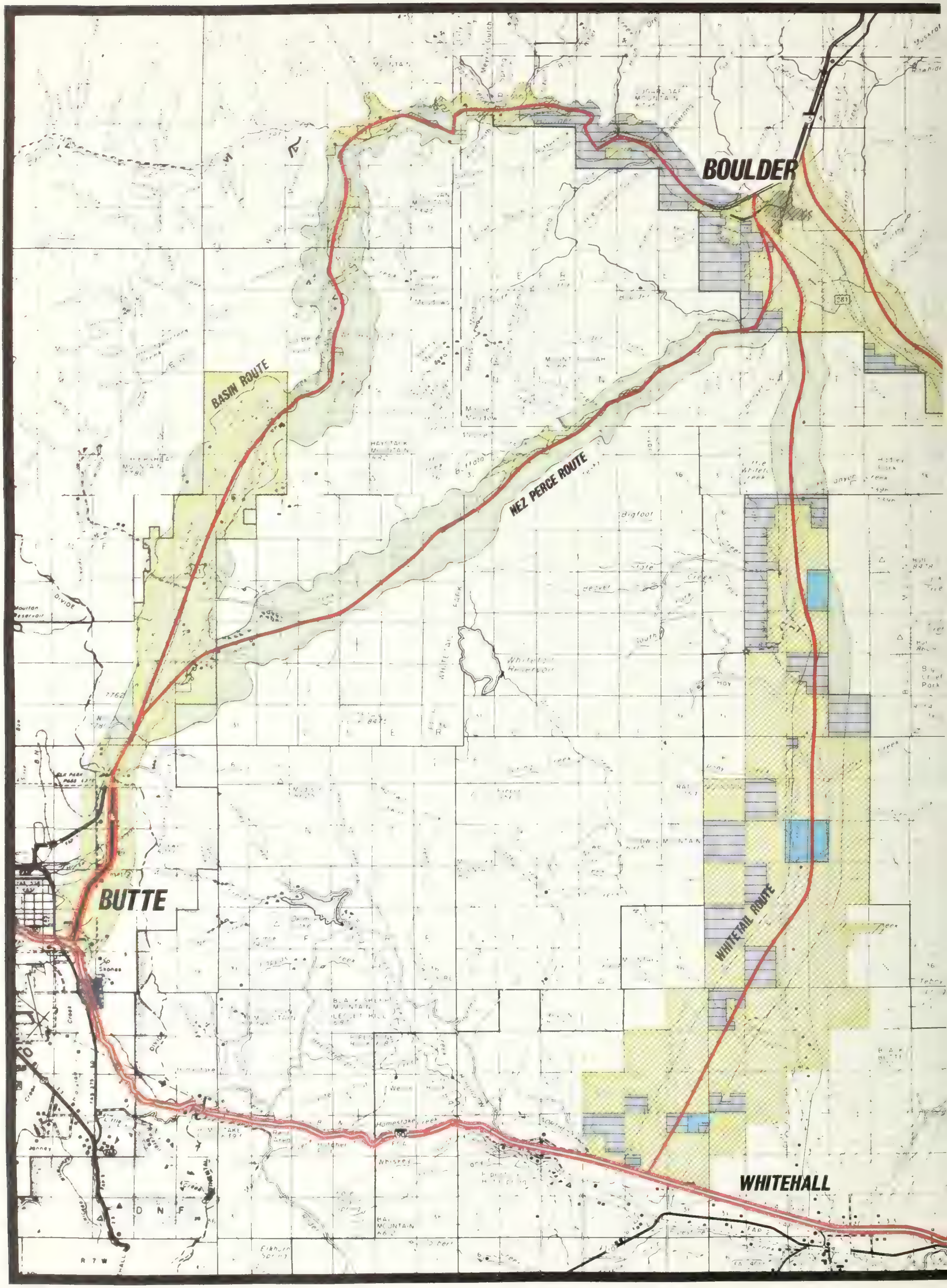
Whitetail Pass - A beneficial impact to retail trades and general business community of Whitehall. . .

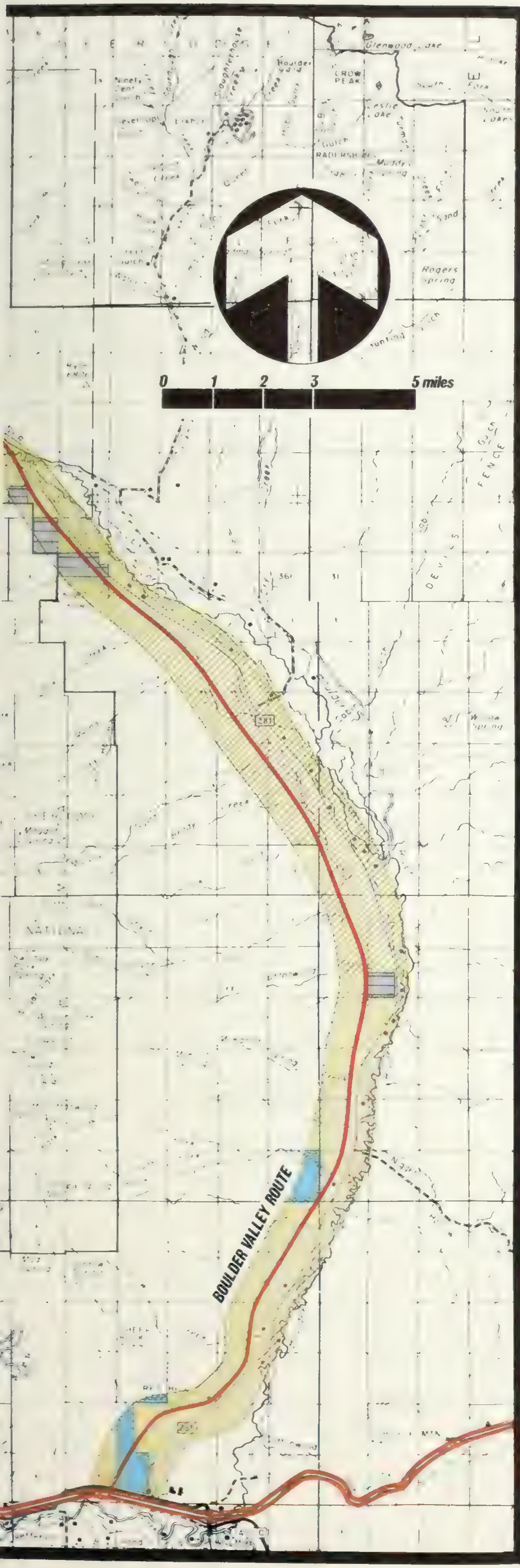
Boulder Valley - Long-term annual loss of 130± AU. . . Significant impact on county tax assessments. . . Increased costs to proposed Boulder River Watershed Project. . . Beneficial impact on general business community of Whitehall. . . No displacement of businesses.

SUMMARY OF ALL CORRIDOR ECONOMIC SYSTEMS BY ALTERNATES

The Whitetail Route would have least adverse effect on other corridors.

(11) O.E.D.P., Jefferson County (R.M.D.C.), dated 1972


BOULDER
BASIN ROUTE
NEZ PERCE ROUTE
WHITETAIL ROUTE
BUTTE
WHITEHALL
Whitetail Reservoir
Moulton Reservoir
281



LAND OWNERSHIP

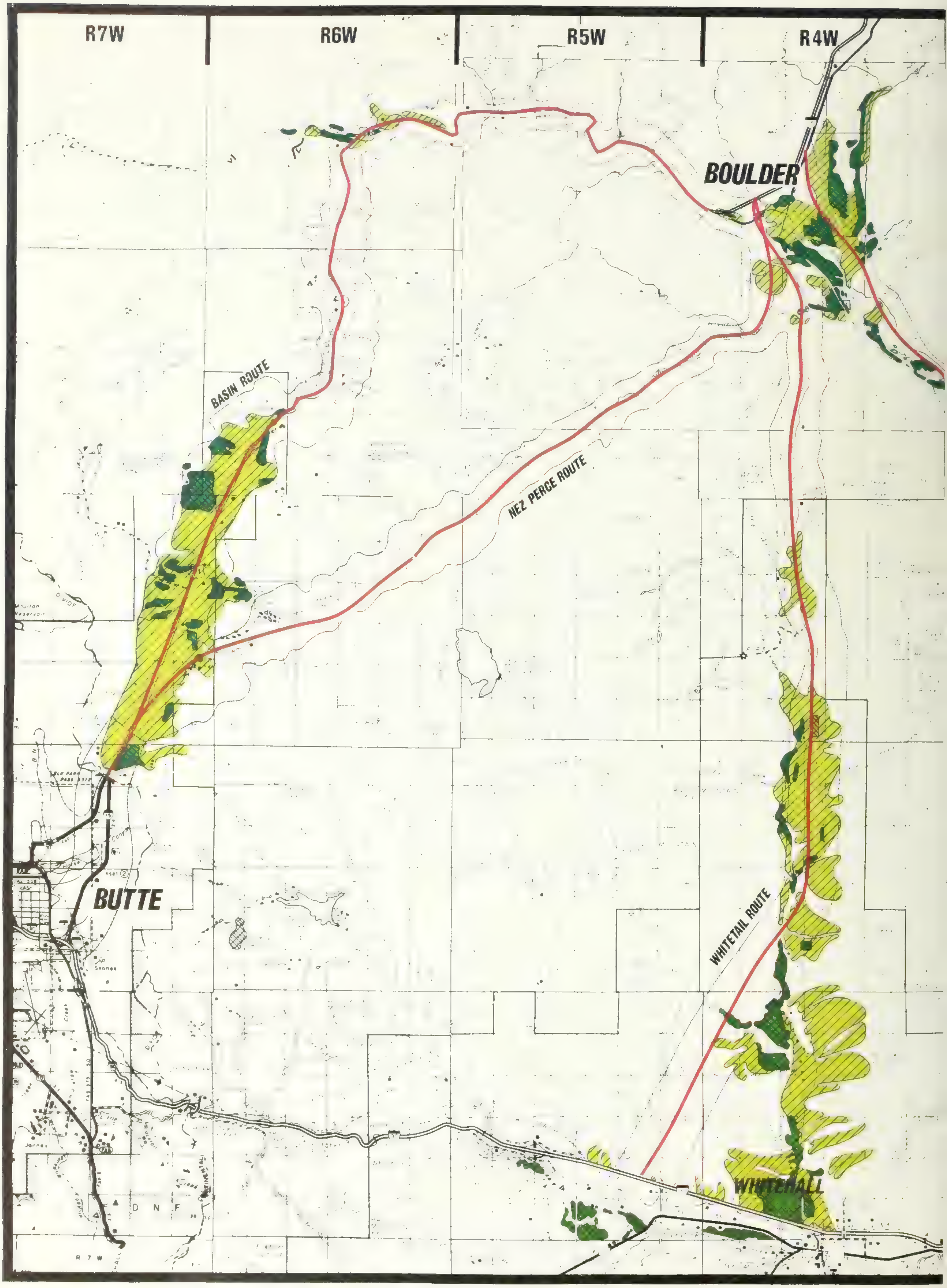
- 🟨 PRIVATE LAND
- 🟦 STATE LAND
- ▤ PUBLIC LAND (B.L.M.)
- 🟩 NATIONAL FOREST LAND

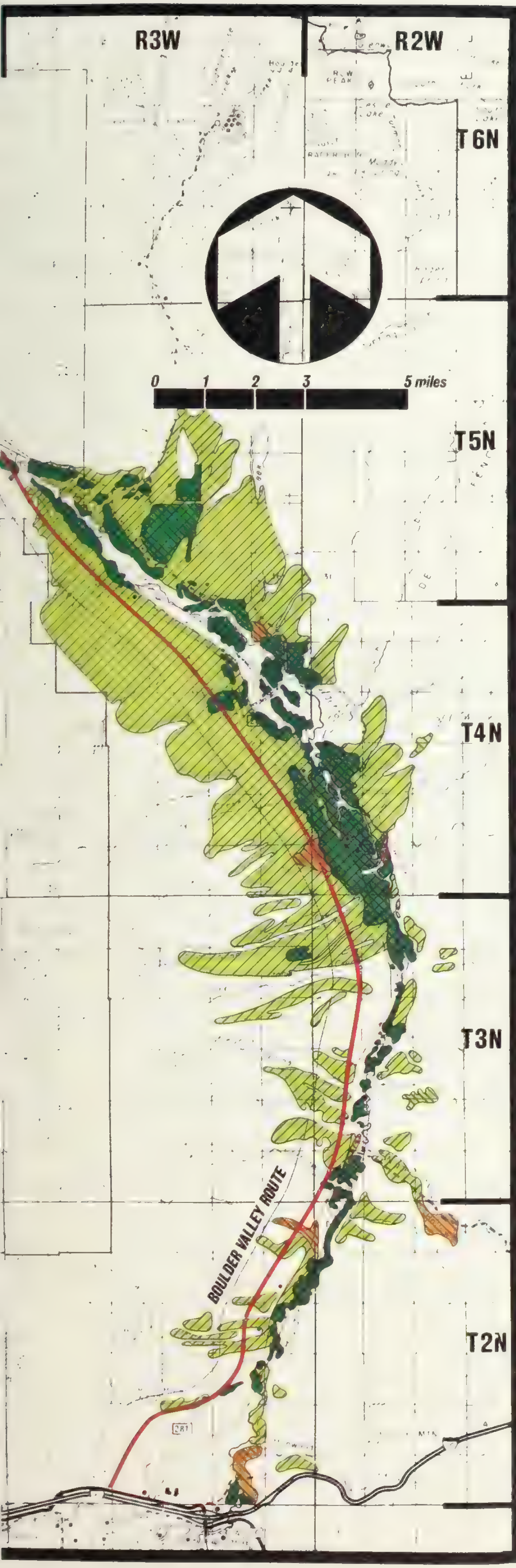
prepared by:
WIRTH ASSOCIATES
ENVIRONMENTAL PLANNING and DESIGN
BILLINGS MONTANA

TAXABLE VERSUS NON-TAXABLE LANDS BY CORRIDOR

Corridor	TOTAL RIGHT OF WAY REQUIRED			TAXABLE LANDS BY PRESENT USE & AREA				
	% Public Non-Taxable	% Private Taxable	Total (Ac)	Irrigated	Wetlands	Dry & Mtn. Grazing	Other	Total
Basin Route	39%	61%	1193	60	17	573	[illegible]	744
Nez Perce	52%	48%	905	5	5	303	[illegible]	433
Whitetail Pass	27%	73%	965	50	55	590	5	700
Boulder Valley	4%	96%	1238	59	38	1071	15	1183

The greatest impact on the county tax base may be the Boulder Valley corridor, however, the greatest number of building improvements taken would be found in the Basin area of the Bernice-Basin corridor. Nez Perce would obviously have the least impact on the county tax source as 52% of this corridor is through public lands and Whitetail would command next preference.


R7W
R6W
R5W
R4W
BOULDER
BASIN ROUTE
NEZ PERCE ROUTE
WHITETAIL ROUTE
BUTTE
WHITEHALL



AGRICULTURE

- 🟩 EXISTING IRRIGATION
- 🟧 IRRIGABLE LAND CLASS NO. 2
- ▨ IRRIGABLE LAND CLASS NO. 3

prepared by:
WIRTH ASSOCIATES
ENVIRONMENTAL PLANNING and DESIGN
BILLINGS MONTANA

SOCIAL IMPACT BY CORRIDORS

SOCIAL SYSTEMS OF BASIN ROUTE CORRIDOR

The principle identifiable "people" impacts in the Basin Route corridor, other than the economics, are displacement of people and the need for reasonable access to schools, churches, medical facilities, trading centers, places of employment, local services, recreation and communications. Due to the ruggedness of the surrounding mountainous terrain, the majority of the people living in this sparsely settled section of Montana have located in the communities of Basin and Boulder and adjacent to U.S. 91. Many of the gulches and creeks that drain into the Boulder River are settled predominantly with mining shacks, summer homes and mountain cabins.

Boulder River School & Hospital. . .

Public facilities and services available in Boulder and Basin have been described in the preceding text of this report. Elementary schools are located in Boulder and Basin. A high school, Jefferson County High, serves this section of Jefferson County. School District 7 has busses that circulate daily through the Bernice-Basin area on U.S. 91 during the school term. Originating at Boulder, one 42 passenger bus travels westerly to Bernice, picks up from 20 to 25 junior high and high school students, and then returns to Boulder.

There are no churches, medical services or police agencies located within the Basin Route corridor except as described under "Communities." U.S. 91 also provides the Basin Volunteer Fire Department ready access to most residences needing fire fighting assistance. Postal services are furnished in Basin and Boulder to the area residents. Because there is no local postal delivery service provided to the rural residents they must travel to the post offices for mail.

RELOCATION BY CORRIDOR (Estimated)

	Basin Route	Nez Perce	Whitetail Pass	Boulder Valley
Residence (Permanent)	7-9	0	0	2
Residence (Non-Perm.)	2	2	0	1
Business	0	0	0	0
Industries	0	0	0	0

Due to the limited local industries and commercial activities in the area, most residents must commute to Boulder or Butte for employment. The principle places of employment near the corridor are the Pacific Silica Company of Basin and the Boulder River School and Hospital in Boulder. Access to outdoor recreational sites is another important function of U.S. 91 and the many county and forest roads of the area. The Boulder River and Bison Creek drainage is a popular area for picnicking, camping, fishing, hiking and other outdoor activities.

Other Social Considerations (Basin Route)

The social and economic climate of the Basin corridor is very similar to the county (Jefferson) as a whole. These deficiencies and potentials have been identified by the O.E.D.P. Committee in their 1972 report as Area Goals, Action Programs, and other statements as follows:

> Housing - Housing in Jefferson County is generally substandard and reportedly not in sufficient supply and not in good condition.
>
> Area Goals - (1) Promote continued development of Jefferson County as a bedroom and playground for Butte and Helena, (2) Encourage development of recreational and tourist facilities, (3) Expand resources based industries, (4) Improve public facilities and community services, (5) Improve transportation systems, and (6) Institute community awareness programs.
>
> Proposed Action of Action Program - (1) County-wide land use planning, (2) Basin Sewer and Water, (3) Highway 281 - Promote north-south truck and tourist traffic along water level route from Helena to Dillon, and (4) Elk Park to Boulder snowmobile trail promotion.

There are no known or recognizable neighborhoods of minority races or religious groups in the Bernice-Basin area. Although county wide per capita income is 40% below the national average (12), there are no identifiable low income neighborhoods in or around the corridor.

---

(12) Department of Commerce, Bureau of Census (1970)

IMPACT ON BASIN ROUTE'S SOCIAL SYSTEMS

Basin Route - Require relocation of 9 to 11 families. . . Decent, safe and sanitary housing would be provided. . . Added short-term pressures on school systems. . . Medical, police and fire protection adequate. . . Access provisions would perpetuate other social patterns. . .

Nez Perce - No significant impact on social systems of Basin Route.. .

Whitetail Pass - No significant impact on social systems of Basin Route. . .

Boulder Valley - No significant impact on social systems of Basin Route.

SOCIAL SYSTEMS OF NEZ PERCE CORRIDOR

Due to the absence of year-around residents in the Nez Perce corridor, recreation is the predominant social activity of this corridor. There are nine summer homes located within the Nez Perce - Little Boulder drainage that are dependent for access on low standard forest service roads. Owners of the cabins in Sawmill Gulch reside during the winter months in Butte and the surrounding locale. Consequently, no schools, churches, medical facilities, etc., have developed through this region as close proximity to Butte has made these social amenities unnecessary. On the northerly end, social services and activities are available in Boulder. Public facilities and services available in Boulder have been previously described in this report.

Currently, access to the Nez Perce region is via a primitive county road that utility companies, hunters and campers use to penetrate this remote area. This trail is traversible during the summer months with four-wheel drive vehicles. Being relatively undisturbed, game is plentiful and the region is popular with big game hunters Deer and elk can be found in the higher areas of the corridor. This area is also popular for picnicking, hiking and camping.

There are no minority races, religious groups or low income families located within or adversely affected by the Nez Perce Corridor

IMPACT ON NEZ PERCE SOCIAL SYSTEMS

Basin Route - No significant effect on the social systems of Nez Perce. . .

Nez Perce - Recreationally, exposure would eliminate this area for those looking for a "wilderness" experience. . . Possible elimination of access to summer homes. . .

Whitetail Pass - No significant impact on Nez Perce. . .

Boulder Valley - No significant impact on Nez Perce.

SOCIAL SYSTEMS OF WHITETAIL PASS CORRIDOR

The cultural and social systems of the Whitetail Pass Area originated with and continue to develop around ranching. As described in the economic impact analysis of the Whitetail corridor, five ranch families reside in or near this corridor. Terrain, climate and the existing county road system has resulted in these residents being socially oriented toward, and dependent on, the community of Whitehall Foodstuffs and dry goods are available in Whitehall as are medical, dental, legal and religious services.

Whitehall High and Elementary School are important to residents for education of their children and for entertainment to the adults of the area. School children are bussed from Whitehall daily during the school term over the county road. Whitehall High School has a 1973 enrollment of 213 pupils and the grade school has 425 pupils.

There are no churches in or near the Whitetail Pass corridor. Religious services are conducted in Protestant and Catholic churches of Whitehall. Fire and police protection are also available from the Whitehall area.

The existing county road from Boulder to Whitehall is an important farm to market road serving the sparsely settled area. It is also the link to civic and social affairs in Boulder and Whitehall. As an agricultural corridor, another important use of the road is for inter-ranch travel, as ranch operations center around and near this facility.

There are no minority races, religious groups or low income families in or near the Whitetail Pass Corridor that would be adversely affected by Interstate construction.

IMPACT ON THE WHITETAIL PASS SOCIAL SYSTEMS

Basin Route - No significant impact on the social systems and patterns of Whitetail Pass. .

Nez Perce - No significant impact on the social systems of Whitetail Pass. . .

Whitetail Pass - No displacement of people. . . Improved road system would abet social contacts. . . No impact on minority groups. . .

Boulder Valley - No signficant impact on the Whitetail Pass social systems.

SOCIAL SYSTEMS OF BOULDER VALLEY CORRIDOR

The social systems of the Boulder Valley have the Cardwell-Whitehall area as their southerly focus, and Boulder as their northerly focus. The greatest density of people and homes are located near the highway or nestled in the sheltered bottoms of the Boulder River. Ranches and residents are found in greater numbers near the terminals of the corridor - Boulder and Whitehall - due primarily to the presence of part-time ranchers who are employed in those communities.

There are approximately thirty families that live in or near the Boulder Valley corridor. Extensive use of the State secondary route 281 is made by residents of the Elk Horn and Nigger Hollow areas. Primary and secondary schools are available in Boulder and Whitehall. School busses from Whitehall circulate northerly for children in the southern sector of the corridor while busses from Boulder serve the northerly 17 miles of this region. Boulder busses pick up and discharge 22 students during the school year from ranch families in the Boulder Valley corridor.

Twelve miles southeasterly of Boulder is the Church of the Valley (St John the Baptist-Catholic Church) with a small cemetary located nearby Churches of other denominations are available in Boulder and Whitehall. Medical services and facilities are also available locally, but surgical and serious diseases (patients) are referred to more sophisticated facilities in Butte, Bozeman and Helena. The rural community of the Boulder Valley relies on the county sheriff's office for police services.

There are no minority races, religious groups or low income families located within or adversely affected by the Boulder Valley Corridor.

IMPACT ON BOULDER VALLEY SOCIAL SYSTEMS

Basin Route - No significant effects on the social systems and patterns of the Boulder Valley. . .

Nez Perce - No significant impact on social systems operating in the Boulder Valley. . .

Whitetail-Pass - No significant impact on social systems and patterns in the Boulder Valley. . .

Boulder Valley - Possible relocation of three families. . . With replacement housing provided. . . Improved access to schools, churches and medical facilities. . . No impact on minority groups.

SUMMARY OF ALL CORRIDORS SOCIAL SYSTEMS BY ALTERNATES

Whitetail Pass would have the least adverse and some beneficial effect on the social system of the study zone.

Church of the Valley. . .

SUMMARY AND CONCLUSIONS

It is generally agreed by the study team that the evaluated alternates provide various advantages and disadvantages to the social and economic systems of the region. The communities of Butte, Basin and Boulder are most directly effected in both the short and long run.

Butte - All alternates under consideration continue to route Interstate 15 through the City. Studies referred to in the text and listed in the references, indicate that reroute and circuitous alignments will have little effect on the social and economic stability of the community. Some tourist oriented businesses will be affected since traffic projections indicate approximately 500 units per day loss on all entrances to Butte when comparing the routes which extend southerly from Boulder. (Boulder Valley or Whitetail) with the proposed westerly (Nez Perce or Basin) routes. This difference is based on 1987 projections of 15,100 and 15,600 units per day respectively.

Most freight oriented businesses have expressed opposition to all routes except Basin, contending increased operating costs. All alternates will require similar minimal readjustments of existing socio-economic systems within the Butte community.

Basin - Nearly all of the business community is tourist oriented. Traffic projections indicate that, exclusive of the Basin Route, the largest volume of traffic would remain through the business district by selection of the Boulder Valley alternate. Visibility, an important element in attracting business, would be a factor present in the selection of the Basin Route and would minimize somewhat, the bypass effect. Mining development could be restricted by the Basin Route due to creation of access problems

Boulder - Local industry is the strong factor to the stability of the community, therefore the "bypass" by any of the routes will not have a great effect on the community. During the short term, all routes would be of a business benefit to the community, however, the pressure of the construction force to provide housing, school, etc., would be experienced.

From the studies by Route, various effects were noted; some measurable by degree of benefit to communities and other factors can only be rated from the greatest through the least adverse effect on community or corridor. In order of their preference from last to first, the study results are:

Boulder Valley - would have the greatest impact on agriculture and the tax base of the county; (59 irrigated and 1183 total ac. for R/W). The route would provide little or no benefit to the residents of this study zone and cause the greatest out-of-direction travel between the larger population areas. The corridor currently has a paved all season highway that serves the local area and communities. Some relocation of families may result.

Whitetail Pass - would be beneficial to the businesses of the community of Whitetail. Socio-economic benefits would be felt in and between the communities of Boulder and Whitehall due to reduced travel time provided by this route. The long term adverse effects would be the loss of traffic from the Basin community and the impact to the agricultural production (50 irrigated and 695 total acres for R/W).

Nez Perce - This route would be the shortest of the four being studied, however, it would not provide service to any communities between its termini. This route would divert traffic from the marginal businesses of Basin. It would have minimal social impact. This route would also require extensive utility relocation.

Basin Route - would provide the greatest increase of traffic to the Butte area and require the least readjusting of existing socio-economic systems. It would have the least adverse effect on the Basin community. There would be a long term adverse effect on the agriculture (60 irrigated and 680 total acres required) and mining operations, and would require the relocation of the greatest number of people. (7 to 9 permanent residences)

APPENDIX

TO

SECTION V

SOCIO - ECONOMIC STUDY

April 10, 1973

Mr. Robert E. Champion, P. E.
Supervisor - R/W Section
State of Montana Department
of Highways
Helena, Montana 59601

RE: 1 15-3(11)(12)(13)
Butte - Boulder
Ref: 62 - MLN

ATTENTION: Marvin Nelson
Manager, Plans Unit

Dear Mr. Champion:

The following information is provided as requested regarding impacts of the four alternative routes of Interstate Highway I-15 from Boulder to Butte on the Boulder River Watershed project.

A Preliminary Investigation Report was prepared by the Soil Conservation Service on this project in 1963. Progress was held up on the project when the sponsors were unable to form a drainage district in 1965 and 1966 due to adverse land rights interests. In 1972 the sponsors were able to negotiate for the key land rights and requested that planning of the project be continued. Some additional data were prepared to update the preliminary report and plans were made to do more detailed planning studies in 1973. Just recently the sponsors obtained a favorable ruling from the district judge, allowing for the formation of the drainage district which will serve as a sponsoring legal organization.

This watershed project would consist of a dam on the Little Boulder River, just above the crossing of the Whitetail Pass Road; new or improved delivery canals serving irrigated land in the Boulder River valley; and a diversion out of the main Boulder River into the reservoir.

Each of the four proposed highway routings for Interstate Highway I-15 from Boulder to Butte would have different impacts on this watershed project. On behalf of the sponsors, it is recommended that the Basin Canyon route be followed since it would have the least adverse impact on this watershed project. A brief discussion of the impacts of the four alternative routes is contained below.

Basin Canyon:

This routing appears to have virtually no effect on the watershed project. The diversion out of the main Boulder River would be just above the town of Boulder and below highway construction.

Nez Perce:

This routing would be through the upper portion of the reservoir basin. Unless the highway is located far enough above the valley, reservoir storage would have to be reduced, thereby making inefficient use of the dam site and restricting downstream irrigation development. It is possible that this reduced reservoir capacity would make the project infeasible.

Whitetail Pass:

This routing would cross the Little Boulder River near where the dam site is planned. If this routing is selected, it would be recommended that the alignment of the highway be shifted to either use the dam as a crossing for one lane or place both lanes below the dam. Without a highway alignment shift, this routing would severely affect the project and probably preclude its development since there is only one practical dam site on the Little Boulder in this vicinity.

Boulder Valley:

A routing of Interstate Highway I-15 down the main Boulder River would pass through areas to be irrigated by the project. In some instances the canal and part of the irrigated area would be above the highway. This routing would create many inconveniences and reduced efficiencies to ranchers because of the cut-up fields. It would be very difficult to make efficient use of irrigation water even if a number of irrigation crossings were provided.

We would appreciate being kept informed of the progress on the I-15 project, including notices of any hearings or public meetings to be held. We would ask that you also send any notices of meetings, environmental statements, etc., to the watershed project sponsors in care of:

Paul Smith, Chairman
North Boulder Drainage District
Boulder, Montana 59632

The sponsors plan to hold a meeting for all interested and concerned agencies to discuss planning inputs to the watershed project some time in the next two or three months. We are currently developing basic engineering and hydrologic data so that alternatives can be better discussed. You will be notified of this meeting and it would be appreciated if a representative could be available to discuss the status of the Highway Department planning relative to I-15 and the watershed project.

We note in your letter of February 9, 1973, that you have a copy of the Preliminary Investigation Report and a land ownership map showing the diversion ditch and proposed reservoir. We are enclosing an additional copy of the land ownership map with the alternative highway routings sketched in near the reservoir basin.

If we can provide further information regarding the Boulder River Watershed project, please do not hesitate to call on us.

Sincerely,

Frank J. Schledorn
for A. B. Linford
State Conservationist

Enclosure

cc: Paul Smith, Boulder, Mt.
Walter Anderson, Area Conservationist, SCS, Bozeman, Mt.
Charles Bordsen, District Conservationist, SCS, Whitehall, Mt.

POSITION AND POLICY PAPER ON THE DIVERTING OF INTERSTATE I-15

We feel that the Port of Butte will have a significant effect on the state of Montana's economy in the years to come. Both Montana's agricultural and industrial communities have always been burdened by the cost of transportation both in and out of the state. Due to very significant rate reductions by the Port, Butte and Montana are now in the main stream of both international and domestic trade.

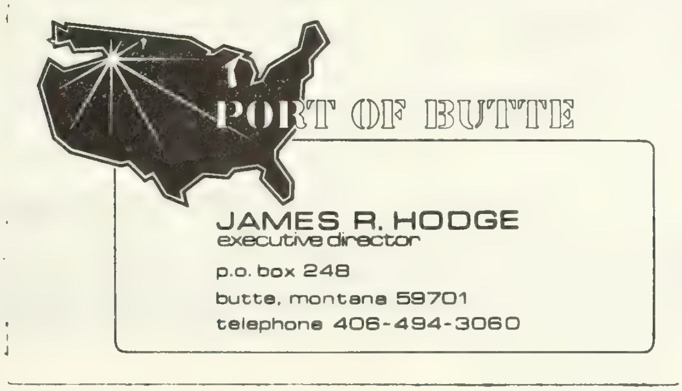
With the availability of the rates, the Port, and new markets both abroad and at home, the state of Montana can begin diverting main arteries of transportation away from present corridors.

During the past few months, the Port staff has had discussions with industrial and municipal leaders both in Great Falls and in Helena. These cities and other cities in Montana must have expedient access to the distribution network created by the Port of Butte. Both of these cities and many others throughout Montana are actively involved in Industrial development programs, and if they can avail themselves of the Port's land distribution system, they have a very real and viable applicaation to both domestic manufacturing and importing and exporting firms.

Because the Port of Butte will be an accumulation center for agricultural exports, it is vital that the farming community have a very fluid commodity movement through our gateway.

Another major reason that Butte was selected as the site of this inland distribution center was that we not only have the necessary rail connections, but Butte sits astride a major intersection of the Interstate Highway System. If this intersection is taken away from Butte, it will provide a definite impediment not only to the development of the Port, but the accessibility of the advantages offered by the Port to the other communities in Montana.

We feel that the basic reasons for having a North-South interstate highway should be reviewed very closely by the decision making bodies. Butte has a definite and precise transportation need for the intersection. We feel that if this intersection remains in Butte, the economic development potentials of the Port and the state of Montana as a distribution hub are almost limitless.



PORT OF BUTTE

JAMES R. HODGE
executive director
p.o. box 248
butte, montana 59701
telephone 406-494-3060

MONTANA BUREAU OF MINES AND GEOLOGY

BUTTE, MONTANA 59701

OFFICE OF THE DIRECTOR

March 12, 1973

Mr. J. Walter Scott, P. E.
Morrison-Maierle, Inc.
910 Helena Avenue
Helena, Montana 59601

Dear Walter:

Butte-Boulder Interstate

Please accept my apologies for the delay in answering your letter of February 13. There were several other reports underway when your letter arrived.

Willis Johns, our Chief Geologist, prepared the attached memorandum and maps to show the known and inferred faults. Willis did a good job on this and his map shows that there are faults on or along all the proposed routes. Not all of the area has been carefully studied, however, and there are other fault systems not shown on the map. I am certain that a major high-angle fault is north of and parallels the present route of Interstate 90 in the Whitehall area. Further, the north-south trending mountain ranges north of Whitehall and Cardwell should be genetically related to a north-south system of block faults (similar to the Hebgen Lake fault).

Relative to the geologic structure, I would state that all of the proposed routes will cross, be parallel to, or be tangent to faults. More fault structures show up in the Butte-Basin area, but only because it has been the object of more careful study. The whole area is similar seismically, but probably most of the recent small shock centers are toward the east. At any rate, there has been no fault slippage within the map area in recorded history, with the possible exception of the Emma vein in the city of Butte (noticeable vertical displacement is attributed, however, to subsidence caused by mining). I can say that the area has been stable for centuries and will probably be stable for centuries more.

THE BUREAU OF MINES AND GEOLOGY WAS ESTABLISHED BY LAW IN 1919 TO PROMOTE EFFICIENT DEVELOPMENT OF MONTANA'S MINERAL RESOURCES BY GATHERING AND PUBLISHING INFORMATION ON THE GEOLOGY, TOPOGRAPHY, AND MINERAL DEPOSITS OF THE STATE INCLUDING METALS, NON-METALS, COAL, OIL, GAS, AND UNDERGROUND WATER SUPPLY.

The only mining activity now foreseen would be in the Basin locality, and on Little Boulder Creek south of Boulder. The rising price of gold and silver may bring renewed activity in the Basin mines, and the old "Chinese Diggings" on Little Boulder may be dredged at some future date. It is worth noting that old mines and prospects are present along the Little Boulder. Furthermore, highway construction along any of the four routes might result in new discoveries of ore. The Basin area and the silica deposit east of Basin are the currently known, relatively recently or currently worked mines. The silica deposit will be worked out and abandoned in the near future, and highway construction would have little effect on the Basin mines, provided that the right of way can be negotiated on a practical basis. To summarize, both the Basin and the Nez Perce-Little Boulder routes would go through areas of known but limited mineral potential. A precautionary note is made, however, in that (as previously stated) highway construction on any of the proposed routes may bring about the discovery of heretofore unknown deposits.

I do not believe there would be any involvement with the Montana Mined Land Reclamation Act. This act is specific in its relation to mining, and highway construction is not involved, except as it includes production of sand and gravel.

Sincerely yours,

S. L. Groff, Director
and State Geologist

Enclosures
cc Mr. Max Stone

MONTANA BUREAU OF MINES AND GEOLOGY

BUTTE, MONTANA 59701

March 12, 1973

MEMORANDUM

TO: Dr. S. L. Groff

FROM: W. M. Johns

RE: Structural elements along and adjacent to Basin, Nez Perce, Whitetail, and Boulder Valley proposed Interstate 90 routes south of Boulder, Montana

In accordance with the letter from Mr. J. Walter Scott, Morrison-Maierle, Inc., we have plotted faults and lineaments of weakness on a base map showing four proposed Interstate 90 routes, south of Boulder, Montana.

This compilation of data on faulting in southwest Jefferson and eastern Silver Bow Counties has been acquired from Geological Survey publications and road logs, a YBRA geological report, an International Geological Congress Guidebook, and one Montana Tech thesis. References from which the data were acquired are listed in this memorandum.

A brief description of structures is as follows:

Continental Fault:--This fault is classified as a high-angle normal fault striking north to slightly west of north with the west side being dropped relative to the east side. The Continental Fault is reported to be traceable for 3 or 4 miles and is believed to continue an additional 10 miles in a northerly direction. East of Butte the fault dips 70° W., and has a vertical component of displacement between 1,000 to 1,800 feet. About 25 feet of tough blue-gray gouge marks the position of the Continental Fault in underground workings east of Butte. To my knowledge there has been no recently recorded movement on this fault, and it is believed the structure has been inactive for a considerable period of geologic time.

Nez Perce Fault:--The Nez Perce fault follows Nez Perce valley for 9 miles, crossing Elk Park and continuing southwest toward Butte. The fault has been mapped as a tear fault (strike-slip movement) with the north side moving east relative to the south side. The amount of displacement has not been determined, and to my knowledge, no recorded movement has taken place in recent geologic time.

Elk Park Faults:--Those faults adjacent to Elk Park have not been described in literature. The geologic data was obtained from Geological Survey MF-246.

Boulder Batholith Lineament:--Along the southeast contact of the Boulder Batholith with Cretaceous Elkhorn Volcanics and Cretaceous intrusive rocks, the straight-line contact marks the position of a pre-batholith fault zone (on map as Boulder Batholith lineament of weakness) striking northeasterly that controlled the eastern margin of the Boulder Batholith (east margin of Butte Quartz Monzonite pluton). Pervasive shearing and foliation in Cretaceous intrusive rocks and Elkhorn Volcanics contiguous to the margin of the batholith is present in wallrocks west of Whitetail Creek. Faulting west of and subparallel to this zone of weakness was active repeatedly during and after emplacement of the batholith. Faulting marks the extreme northeast position of this zone east of Whitetail Creek. No recorded recent activity has occurred along this zone to my knowledge.

Faults Northeast of Pipestone Hot Springs:--Several steep northwest and northeast-trending faults are northeast of Pipestone. The Ratio Mountain Fault is reported to have about 1,200 feet of vertical displacement in sec. 1, T. 3 N., R. 5 W. The Gold Fault, mapped between two northeast-trending faults is reported to have about 1,800 feet of vertical displacement. The Route Fault is described as a very young fault of considerable length but small vertical displacement possibly continuing southwest to Pipestone Hot Springs and may be related to recent hot springs activity there. Recent movement along the Route Fault (name used by author to identify structure) is indicated by displacement of Quaternary colluvium in Whitetail Creek. (Geological Survey Bull. 1221-F, p. F19)

Faults east of Whitehall:--Structures northeast of Whitehall are described as normal faults and a high-angle reverse fault creating fault blocks tilted northeast. Faulting probably was active between Early and Late Tertiary time (from 70 million to one million years ago).

Concerning the effect of the four alternate routes on present or potential mining activity, it is my opinion that the Basin route would be advantageous to mining properties in the Boulder-Basin area by providing a better and shorter route to smelters and railheads. Surface disturbance to mining properties would have little effect on mining operations as most properties in this area are fissure vein deposits with underground development and production. The Boulder Valley route could provide the same advantages to mining districts near Radersburg.

The Department of State Lands, administrators of the Montana Mined Land Reclamation Act, write reclamation contracts with highway construction contractors for reclaiming earthwork borrow areas. The Department of State Lands has written a blanket agreement with the State Highway Department for reclamation of sand and gravel pits, and these are reclaimed to the satisfaction of the State Highway Department. Relocation of stream channels during highway construction would be under the jurisdiction of the Fish and Game Department and Board of Health.

cc Mr. Max Stone

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UNION CARBIDE
UNION CARBIDE CORPORATION
MINING AND METALS DIVISION
P. O. BOX 1049, GRAND JUNCTION, COLORADO 81501

March 8, 1973

Mr. E. I. Martinsen
State of Montana
Department of Highways
Field Right of Way Unit
P. O. Box 3068
Butte, Montana 59701

Dear Mr. Martinsen:

Pursuant to your phone request of March 5, 1973, please be advised that the quartz operation at Basin, Montana remains viable and there are no plans to change this status.

If I can be of further help in this matter, please do not hesitate to contact me.

Sincerely yours,

G. A. Carlyle

G. A. Carlyle
Land Manager
Domestic Exploration

GAC/gg

REFERENCES

REFERENCES

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7. WATER RESOURCES SURVEY, JEFFERSON COUNTY, State Engineer's Office, Helena, dated 1956.

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SECTION VI

PUBLIC

INVOLVEMENT

MORRISON - MAIERLE, INC.
Consulting Engineers Helena, Montana

Page

SECTION VI - PUBLIC INVOLVEMENT

PUBLIC OPINION -- 403
Organizations & Individuals Supporting Basin Route-- 404 - 405
Organizations and Individuals Supporting Nez Perce Route -- 405
Organizations and Individuals Supporting Whitetail Route -- 405
Organizations and Individuals Supporting Boulder Valley Route -- 405
SUMMARY OF COMMENTS TO THE DRAFT ENVIRONMENTAL IMPACT STATEMENT -- 406 to 412
RESPONSE TO COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT -- 413 to 416
APPENDIX TO SECTION VI -- 417
Letters Supporting Basin Route -------------------- 418 to 460
Petitions -- 461 to 467
Letters of Comment on Draft Environmental Impact Statement -------------------------------- 468 to 501

PUBLIC OPINION

Of paramount importance is the expression of public opinion regarding the location of Interstate 15 between Butte and Boulder. Through letters and public hearing testimony, 39 organizations and individuals have favored the Basin Route, while 5 have favored the Whitetail Route and one favored the Boulder Valley Route*. Two petitions have been circulated regarding this routing. A petition signed by 38 North Boulder Valley ranchers supports the Basin Route and rejects the Boulder Valley Route. The Interstate 15 Task Force has submitted 476 petitions containing 16,773 signatures of Montana residents and licensed vehicle operators who support the Basin Route. No support has been expressed for the Nez Perce Route. Public hearings were held in Butte and in Boulder on June 28 and 29, 1972. There were combination location and design hearings on Interstate 15 between Butte and Boulder and the Draft Environmental Impact statement was discussed and had been made available to the public earlier. Copies of this transcript are available from the Montana Department of Highways in Helena. The following are lists of organizations and individuals who have indicated a preference by letter or public hearing testimony.

* The Montana Fish and Game Commission has stated that they support either the Whitetail or the Boulder Valley Route.

ORGANIZATIONS AND INDIVIDUALS SUPPORTING THE BASIN ROUTE

An * indicates that the comment was submitted at Public Hearing

Agency or Individual

*Deshler, Butte Cham. Com.

*Belanger, City-Co. Plan. Bd.

U. S. Forest Service

*McLeod, Pres., Mont. Tech.

*Frank Young, P.E.

*Nickerson, Skyline Sportsmen Association

*Harold McGrath, Manager Butte Cham. Comm. Presented Letter from Co. Commissioners (Silver Bow)

*Jack Hanley, Com. Org. Dir.

*Walt Kelley, Mont. Power

*Steve Buttress, Butte local Development Corporation

*Arnold Olsen

*Harry Miller, Magicland Coun.

*Ron Roos, Butte Cha. Com. & Intermountain Trucking Co.

*Shag Miller, Butte Cham. Com.

*Tom Tracy, Trades & Labor Coun.

*George Hetherington

*Joe Sologub, Jeff. County Commissioners

Agency or Individual

*Dr. Len Vainio, Silver Bow Senator

*Bruno Lencioni, Unique Cleaners

*Mike Micone, Mayor of Butte

*Ray Colbert

*Murray Clinic

*Frank Dunkle

*Butte City Council Resolution

*Boulder Area Chamber of Commerce

*Soroptimist Club Butte

James O'Dell, Butte Whittier School Principal

*Katherine DuBois, Mont. Motor Transport Assn.

*Charles Crumb

*Brad Crenshaw

*Leo Zeihen

*Glen Hall

*Stan Huiso

*Jefferson County Commissioners

Agency or Individual

Jimmy Shea, Silver Bow State Senator

Frank M. Monniger, Anaconda Co.

*Tom Powers, Magicland Devel. Corp.

Agency or Individual

A. H. Wilkinson, Butte Postmaster

*Tim Babcock

ORGANIZATIONS AND INDIVIDUALS SUPPORTING THE NEZ PERCE ROUTE

NONE

ORGANIZATIONS AND INDIVIDUALS SUPPORTING THE WHITETAIL ROUTE

*C.M. Wall

*George Oberst

Montana Fish and Game Commission

*Francis Mitchell

*Amil Herseim

ORGANIZATIONS AND INDIVIDUALS SUPPORTING THE BOULDER VALLEY ROUTE

Montana Fish and Game Commission

SUMMARY OF COMMENTS
TO THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

(from written comments and Public Hearing testimony of agencies, groups and individuals - copies of letters of comment from Federal, State and local agencies follow the list of responses. An * indicates that response is from Public Hearings Testimony.)

RESPONSES FOLLOW THE LIST OF COMMENTS

Date	Agency or Individual	Subject Category and Comment
		A. ENVIRONMENTAL DESIGN ARTS
6/28/72	Mont. EQC	1. Insufficient use of Environmental Design Arts
6/29/72	Mont. Fish & Game	2. Effect of frontage & access roads & interchange on Canyon environment
*6/28/72	Dorothy Bradley, Repr. Gallatin Co.	3. Use multi-disciplinary team
6/28/72	Mont. E.Q.C.	4. Use interdisciplinary team
*6/29/72	Rick Applegate	5. Use interdisciplinary team
		B. ENVIRONMENTAL AMENITIES
6/28/72	Mont. E.Q.C.	1. Resource management agencies have not adequately identified environmental amenities
		C. TEXT REORGANIZATION & REWRITING
*6/29/72	Patricia Antonic-Upper Missouri Sierra Club	1. EIS inadequate - rewrite it
*6/29/72	Bill Tomlinson, Montana League of Conservation Voters	2. EIS deficient

D. INNOVATIVE AND OTHER DESIGN MEASURES

Date	Agency or Individual		Subject Category and Comment
6/28/72	Mont. E.Q.C.	1.	Examine innovative design measures
8/21/72	USFS	2.	Discuss use of railroad grade
		3.	Eliminate reference to Bear Gulch-Galena Gulch road by USFS
7/21/72	EPA-Denver	4.	Say more about use of railroad R/W
		5.	Consider reducing design speeds
		6.	Show profiles with extent of cuts and fills and typicals showing cuts and fills and stream channelization where extensive
		7.	Earthwork Data - need for borrow-haul, etc. and amounts (or waste)
		8.	Give estimated quantities of clear & grub operation and proposed method of disposal
		9.	Discuss 2-lane facility e.g., legal or other constraints prohibiting consideration of 2-lane facility
9/20/72	Dept. of Inter	10.	Basin Rte - consider further special design efforts, etc: (a) Gabion type retaining walls (b) Reduce or eliminate 38' c/c with New Jersey type vertical dividers (c) Use more bridges
		11.	Consider bridge near Mi. 146.5 over Bison Cr.
		12.	Show efforts to coordinate with F & G in planning measures to minimize harm to whichever corridor is selected.
*6/28/72	Dorothy Bradley, Repr. Gallatin Co.	13.	Consider 2-lane facility
		14.	Use BNRR R/W as tourist Railroad
6/28/72	Mont. E.Q.C.	15.	Use more innovative highway design

D. INNOVATIVE AND OTHER DESIGN MEASURES (Cont.)

Date	Agency or Individual		Subject Category and Comment
*6/29/72	Bill Tomlinson, Mont. League of Conservation Voters	16.	Consider 2-lane facility
		17.	Use innovative design
*6/29/72	Rick Applegate	18.	Limit exist, US91 to recreation use-I-15 on Whitetail
		E.	EFFECT ON WATER QUALITY & STREAM CHANNELS
6/29/72	Mont. Fish & Game	1.	More specifics on channel manipulations & amount lost
		2.	Pollution of stream during construc.
		3.	Envir. effects on Fish habitat & water quality-effect of stock lane on stream
		4.	Effect of channel manipulation on stream hydraulics - bank erosion if channel length is changed
7/21/72	EPA, Denver	5.	Include soils with respect to erosion & subsequent stream pollution & revegatative qualities after construc.
		6.	In Fish & Game Appendix - include actual data on water quality & analysis data - also for Alt. Rtes if available
		7.	Possible current use of de-icing chemicals & the subsequent effect on water quality
		8.	Surveillance program to monitor stream turbidity levels & other construction induced water quality changes, before, during, & after constr. - Purpose to determine effectiveness of soil & bank stabilization measures
		9.	Changes in stream hydraulics - possibilities stream bed scour, flooding, habitat alteration & effect on exist. aquatic eco. systems

E. EFFECT ON WATER QUALITY & STREAM CHANNELS (CONT.)

Date	Agency or Individual	Subject Category and Comment
		10. Obtain additional water sample data from State Dept. of Health (Ask for analysis & evaluation)
*6/29/72	Arnold Rieder	11. Basin Rte - if built, must meet req'mts of Stream Preservation Act
		F. SECTION 4(f) LANDS REQUIREMENTS
6/29/72	Mont. Fish & Game	1. In general, too little discussion of Envir. effects & of measures to satisfy Sec. 4(f) req'mts
		2. Mitigative measures for loss of Bison Cr. Campground should be expanded upon
		3. Discuss defacto recreation areas
8/21/72	USFS	4. Investigate replacement of present campgrounds with similar facilities elsewhere
9/20/72	Dept. of Inter.	5. More adequate coverage of de-facto rec. areas. These will be largely lost due to restricted access - list as an adverse impact
		6. Page 21 Draft E.I.S. - Rest Area - Campgrounds will not benefit local users. A radical change in user characteristics may occur if Basin Rte is constructed w/locals seeking new more remote sites
*6/28/72	Dorothy Bradley, Repr. Gallatin Co.	7. Give number of recreational users
*6/29/72	Rick Applegate	8. Section 4(f) is deficient
		G. IRREVERSIBLE & IRRETRIEVABLE COMMITMENTS OF RESOURCES
6/29/72	Mont. Fish & Game	1. Section on irreversible & irretrievable commitments of resources is inadequate

Date	Agency or Individual	Subject Category and Comment
		H. ECOLOGY, PLANT & WILDLIFE
6/29/72	Mont. Fish & Game	1. Include discussion on fishing stream & game ranges
*6/29/72	Rick Applegate	2. Conflicting statements from F & G - USFS on wildlife
		3. Lack of depth, ecological field
		I. MAINTENANCE
7/21/72	EPA - Denver	1. Discuss winter icing problems and maintenance on all routes
		J. ARCHEOLOGICAL & HISTORICAL PRESERVATION
9/20/72	Dept. of Inter.	1. Assess archeological values
		2. Nat'l Historic Preservation Act of 1966 (Sec. 106) (a) Indicate that Nat'l Register of Historic places has been checked (b) Indicate contact w/Historic Preservation Officer for Mont. (Chief of Rec. & Parks Div., Dept. of F & G, Mitchell Bldg., Helena, for effect of resources which may be in the process of nomination. (c) If above properties are affected insure that procedures are followed as they appear in the Federal Register, 3/15/72
		K. ECONOMIC & SOCIO-ECONOMIC EFFECTS
7/21/72	EPA - Denver	1. Prepare complete new economic analysis w/annual capital costs, road user costs, and maintenance costs.

Date	Agency or Individual	Subject Category and Comment
		K. ECONOMIC & SOCIO-ECONOMIC EFFECTS (CONT.)
9/20/72	Dept. of Inter.	2. Mineral Assessment, Appendix A - adequate coverage - but, check this section & indicate that accessibility to Hope & Lotta will be affected. Give measures to minimize harm & mineral accessibility.
		3. Check - operations of silica quarry may terminate in 2 - 3 years, stockpile effect
*6/28/72	Dorothy Bradley, Repr. Gallatin Co.	4. Proposed route selection based too much on prelim. economic analysis
*6/29/72	Rick Applegate	5. Economic impact on Basin not studied
		L. GEOLOGY, EARTHQUAKES, & CLIMATOLOGY
8/7/72	USGS	1. Discuss damage which might occur from earthquake - to structure & possible slides which could damage roadway section
9/20/72	Dept. of Inter.	2. Discuss possible earthquake damage to structures and slopes in event of major earthquake
*6/28/72	Dorothy Bradley, Repr. Gallatin Co.	3. Too little geology 4. No climatic study
*6/29/72	Rick Applegate	5. Geology deficient
		6. Hydrology deficient
		7. Climatology deficient
		M. ADDITIONAL STUDY OF ALTERNATES
6/28/72	Mont. E.Q.C.	1. Insufficient alternates studied
*6/28/72	Dorothy Bradley, Repr. Gallatin Co.	2. Alternates not given same amount of as Basin Route
*6/29/72	Bill Tomlinson, Mont. League of Conservation Voters	3. Too little consideration of alternatives

M. ADDITIONAL STUDY OF ALTERNATES (CONT.)

Date	Agency or Individual	Subject & Category and Comment
*6/29/72	Rick Applegate	4. Too little consideration of alternates
*6/29/72	Sam Samson	5. Whitetail needs more study
*6/29/72	Arnold Rieder	6. Further study needed on Whitetail route
9/20/72	Dept. of Inter.	7. Whitetail Rte, more desirable than Basin Rt. relative to Sec. 4 (f) determination - Also study alternate along FAS 281
		N. SUPPORT OF BASIN ROUTE
8/21/72	USFS	1. Support plan to follow Basin Rte.

RESPONSE TO COMMENTS
ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

Comments from the Public Hearings are identified by an *.

Comment Number	Response
A-1,3*,4,5*	Environmental planners, historians, engineers, Socio economic experts and other specialists from contributing agencies cooperated in the preparation of the Final Statement.
A-2	The effect of frontage roads and interchanges on the canyon environment has been assessed along with the Interstate route since in many cases the access roads are part of the roadway prism. This evaluation is included (not separately) throughout the report.
B-1	Resource management agencies have contributed input data and analysis on many subjects. This material was used by the Environmental Planning consultant in the preparation of "The Natural Environment" in Section IV, Phase I, of this report.
C-1*,2*	Deficiency and inadequacy corrected.
D-1, 15	The Environmental Planning Consultant has included this consideration in Phase II, section entitled "Possible Modification of Design Details."
D-2,4,14*	Consideration of the use of the abandoned railroad grade for access and other uses is duscussed in Phase II under the section entitled "Design Features" and "Possible Modification of Design Details".
D-3	The reference to a Bear Gulch - Galena Gulch road has been eliminated.
D-5	Reduction of design speeds and the resulting lower standard facility was considered. This would not be consistent with the concept to provide a high standard facility as is customary on the Interstate system. Also, unless drastically sharper curvature and steeper grades could be used, little advantage would be gained in reducing environmental impact.
D-6	Small scale profiles are shown in Phase I, "Description of Alternates" and channel changes are indicated on the Section 1 aerial mapping in the same section. Cut and

Comment Number	Response
D-6 - contd.	fill limits were not developed to the extent that they could be accurately shown and are therefore not included in the report.
D-7	Earthwork data is included in Phase II, Design Features.
D-8	Clearing and grubbing quantities were not developed. Disposal will be as specified in Montana Department of Highways Standard Specifications.
D-9,13*,16*	Discussion of 2-lane facility appears in Phase II, "Design Features".
D-10,17*	Special design considerations are covered in Phase II, "Possible Modification of Design Details."
D-11	A bridge over Bison Creek at Mile 146.5 was recommended by the Environmental Planning Consultant in Phase II, "Possible Modification of Design Details."
D-12	Montana Fish and Game contributed input to Phase I, Section IV, "The Natural Environment" and were contacted by the Planning Consultant for data on wildlife, fisheries, etc., which is included in this section.
D-18*	Selection of Basin Route as the preferred alternate precludes any future use of existing U.S. 91.
E-1,3,4,9	More information on channel manipulation is in Phase I, Section III, "Engineering and the Environment" and in Phase II, "Design Features".
E-2,5	Soils data with respect to erosion and revegitative qualities was not included. Stream pollution information is found in Phase I, Section III, "Engineering and the Environment" and in Phase II, "Design Features."
E-6,10	This data is not included, but is available from the Montana Board of Health and Environmental Sciences and is the basis for the analysis found in the appendix to Section III.
E-7	The only chemical used on the roadway by the Montana Highway Department is a small amount of salt in the sand used for icy roads to keep it from freezing.
E-8	Surveillance of stream turbidity is covered in Phase I, Section III, "Engineering and the Environment."

Comment Number	Response
E-11*	This will be handled in design.
F-1,2,3,4,5,6, 7*,8*	These have been satisfied by the addition of Phase I, Section IV, "The Natural Environment" and by the revisions to the Section 4(f) Determination, in Phase II.
G-1	This item is more fully covered in Phase I, Section IV, "The Natural Environment" as well as in Phase II, "Irreversible and Irretrievable Commitments of Resources."
H-1,3	Included in Phase I, Section IV, "The Natural Environment."
H-2*	These conflicts have been resolved.
I-1	Snow and ice conditions are included in Phase I, Section III, "Engineering and the Environment" under Climate.
J-1,2	These comments have all been satisfied with the inclusion of the Historical and Archeological assessment in Phase I, Section IV, "The Natural Environment."
K-1	The new analysis is in Phase I, Section II, "Highway Economics."
K-2	This is done in Phase I, Section V, "Socio-Economic Study."
K-3	Silica Quarry will continue to operate according to information in Phase I, Section V, "Socio-Economic Study" Appendix.
K-4*	The entire Impact Statement has been expanded to include more environmental disciplines.
K-5*	Included in Phase I, Section V, "Socio-Economic Study."
L-1,2,3*,5	Geology section expanded to include seismic considerations in Phase I, Section III, "Engineering and the Environment."
L-4*,7*	Climate is covered in Phase I, "Engineering and the Environment."
L-6*	Hydrology study was made in connection with Phase I, Section III, "Engineering and the Environment", and Phase II, "Design Features."

Comment Number	Response
M-1,2*,3*,4*, 5*,6*,7*	The Boulder Valley Alternate has been evaluated along with the three alternates presented in the Draft Statement.
N-1	No response necessary.

APPENDIX TO SECTION VI

PUBLIC INVOLVEMENT

LETTERS SUPPORTING BASIN ROUTE

(There have been no letters of support received for the other three Alternate Routes).

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Federal Building, Missoula, Montana 59801

AUG 21 1972

REPLY TO: 1940 Environmental Statements

SUBJECT: Draft Environmental Statement, Interstate 15
Butte to Boulder

TO: Montana Department of Highways
6th Avenue & Roberts
Helena, Montana 59601

We have reviewed the Draft Environmental Statement for Interstate 15, Butte to Boulder. Our comments follow.

After weighing the complex variables associated with this project, we support your plan to follow the Butte-Basin-Boulder route. Our decision is based on the following points.

1. Overall long term environmental impacts will be less.

a. The Basin route is a long established, well used corridor servicing a U.S. highway, railroad, and transmission lines. Traffic statistics indicate that 500,000 to 1,000,000 people used the route in 1970.

b. Fisheries, wildlife, and other esthetic values have already been impacted to a much greater degree on this location than on the other alternatives. This route will continue to exist and be used by through traffic even if another route is used by the interstate. We believe it is advantageous to confine major routes to as few locations as possible.

c. The Basin Route is about 13 miles shorter than the Whitetail route. A lot of traffic from Butte and the west would continue to use the Basin route. This will lead to eventual reconstruction. If Whitetail is selected this will put the impact of interstate construction in one place and reconstruction in another.

2. The Basin route may be the safest.

a. Many travelers will continue to use existing Highway 91, Butte to Boulder even if the interstate is built on the Homestake route.

b. North-south traffic through Butte would have to use Homestake Pass, which is considered hazardous.

3. It is probable that the Basin route best meets the intent of the Highway Act in serving people.

Should the route through Basin be selected, maximum effort should be used to utilize the abandoned railroad grade between Butte and Basin. This plus the use of structures as used in European highway construction and suggested by Fletcher Newby on the Environmental Quality Council should minimize impacts between Elk Park and Basin. We have worked closely with the Montana Highway Department in minimizing impacts on established public facilities covered under Section 4(f) of the Highway Act. We have agreed to eliminate Bison camp and use the replacement monies at Shamrock and Elk Park with rest area facilities at the entrances of the campgrounds. This would restrict camper use to interstate highway users.

This commitment is confirmed in a memorandum dated April 2, 1970, (copy attached) from past Regional Forester Neal Rahm to the Highway Department. This past involvement led to the proposals dealt with in some detail in the Draft Environmental Statement.

Unless final design decisions have been made which would prove impractical to change, we would like to explore in greater detail, alternative No. 2 of page 8, Appendix B for Draft Environmental 4(f) statement. This alternative is to "Eliminate all three campgrounds and provide replacements in other locations." We can live with the earlier decision and commitments, but feel it is possible that other alternatives would better serve the intent of National Forest campgrounds.

As pointed out in the report, fairly heavy use of the existing campgrounds is by area persons. It is likely that the decision to combine the campgrounds with interstate rest stops would effectively restrict or eliminate use except by interstate travelers. If suitable and acceptable locations for replacement under classification 4(f) can be found within 5 miles of the proposed interstate, it is probable that service to area residents, as well as interstate travelers, can be accomplished. Perhaps better locations of the rest stops, such as the Highway Department land at Bear Gulch, would be possible.

In the discussion of this alternative in Appendix B of the Draft Statement, we gather the Highway Department still sees this as a viable alternative. We wish to investigate it in greater detail before a final decision is made to develop rest stops at the two existing campgrounds.

We feel the Highway Department is to be complimented on the attempts they have made to evaluate impacts and their projections to minimize impacts. Every practical means should be utilized to balance and minimize total social, economic, and environmental impacts, regardless of which route is finally selected.

We are confident other agencies will make specific comments regarding their areas of prime responsibility. Therefore, we have not made detailed comments regarding resource impacts in areas such as fish and wildlife, air and water pollution, etc.

Under Item II, INTRODUCTION, OTHER ENVIRONMENTAL FEATURES, page 11, there is a correction needed. The Forest Service has no plans at this time to develop a road between Galena Gulch and Bear Gulch. Past discussions have considered a possible road. However, since that time we have identified this area as a "roadless area" and all previous plans have been cancelled pending future Multiple Use Area Planning for the area.

Lawrence M. Whitfield
for STEVE YURICH
Regional Forester

Enclosure

Date Recd. Preconst. 8-25-72
Act Info MAIL ROUTE Attach Initial
30 GO?? RMH
30 [illegible] Design
30 [illegible] Design
Consultant Design ✓
File ✓

MONTANA BUREAU OF MINES AND GEOLOGY

BUTTE, MONTANA 59701

OFFICE OF THE DIRECTOR

June 26, 1972

MEMO TO: Dr. K. N. McLeod, President, Montana College of Mineral Science and Technology

FROM: S. L. Groff, Director and State Geologist

RE: Statement Regarding Route of the Interstate Highway Between Boulder and Butte Area

Three possible routes have been discussed for the interstate highway between Boulder and the Butte-Whitehall area. These are (1) Boulder to Butte essentially along the present highway through Basin, (2) Boulder to Butte over the Nez Perce Pass, and (3) Boulder to Butte through the Whitetail Valley to Whitehall and thence over Homestake Pass by the present interstate highway.

In my capacity as State Geologist, my preference for the route of the interstate is in the order set forth in the preceding paragraph. The reasons for this preference are as follows:

1. I believe it was the intent of the Administration and Congress to connect the principal metropolitan centers of a given region as directly as possible through the interstate highway system.

2. The Basin route and the Nez Perce route are the most direct routes from Butte through Boulder to Helena.

3. The Basin route will have far less impact on the environment than the Nez Perce route (particularly with respect to wildlife).

4. The Basin route is the most scenic and the town of Basin could well become a major tourist attraction (as Butte is at present).

5. The abandoned railroad bed between Butte and Boulder may well be of material aid in construction of the highway (levels have been surveyed and tunnels are in existence).

THE BUREAU OF MINES AND GEOLOGY WAS ESTABLISHED BY LAW IN 1919 TO PROMOTE EFFICIENT DEVELOPMENT OF MONTANA'S MINERAL RESOURCES BY GATHERING AND PUBLISHING INFORMATION ON THE GEOLOGY, TOPOGRAPHY, AND MINERAL DEPOSITS OF THE STATE, INCLUDING METALS, NON-METALS, COAL, OIL, GAS, AND UNDERGROUND WATER SUPPLY.

6. State and federal funds for the interstate highway system have already been expended for surveying and construction in both the Boulder and Butte areas, with the Basin route as the primary objective.

7. The junction of the interstate going south through Dillon is on the outskirts of Butte, as would be the junction from Butte to Helena, if the Boulder or Nez Perce routes are utilized.

8. Besides the environmental impact, the Nez Perce route would have a steep grade, which would be objectionable to truckers.

In summary, there seem to be advantages and problems with all three routes. It seems practical, however, that three of Montana's major cities, Butte, Helena, and Great Falls, should be connected by the most direct route possible. The Basin route has the advantage of the present highway, an abandoned railroad bed, a completed survey and some construction, and the greatest scenic values. The Nez Perce route is the shortest, but will have the greatest impact on the environment and the steepest grades, The Whitetail route involves the abandoning of completed construction and moving the intersection 20 miles or more east of one of Montana's major cities. Under present considerations, the Whitetail route may have what is thought to be the least environmental impact. Yet, there is already a paved highway on the Basin route, and the corridor through the natural environment has been established. Thus, why not use this corridor and improve it, because it is the route that the vast bulk of official and pleasure traffic uses. In any event, the Butte-Basin-Boulder route will have to be rebuilt and improved.

I strongly favor and support the Basin route for the interstate highway.

FRANCIS M. YOUNG, P.E.
MINING, GEOLOGICAL AND SOILS ENGINEERING
825 EVANS AVENUE
BUTTE, MONTANA
59701
OFFICE 792-8321
RESIDENCE: 792-5883

June 27, 1972

The Montana Highway Commission
Butte, Montana 59701

Gentlemen:

The following is a brief discussion of the economic necessity of having I-15 routed through Basin (the Basin Route) with regards to the small mine operations that are presently operating and which may operate in this area in the future.

At the present time there is one mining operation shipping ore and that is the Crystal Mine north of Basin. The owners of this mine need a paved road between Basin and Butte. It would be economically unfeasable to utilize the Nez Perce or Whitetail Routes because at a cost of 10 cents per ton mile the additional hauling costs would be $1.10 to $2.70 per ton of ore shipped to Butte. Consequently, the ore would have to be hauled over the present travelway, which travelway would have to be improved and maintained.

However, the impact of one operation would not in itself have much bearing on the decision as to which route should be selected. It should be noted that there has been much interest in this area from both major mining companies and smaller organizations. Selection of the Basin Route could possibly help to stimulate further mining activities because of a potential reduction in hauling costs both for supplies and for ore shipments. It should be noted that there is a potential for a great amount of mining in this area in the future, while there is much less potential in the areas served by the other routes. This is a matter that should be considered when the environment of the three routes is discussed. When the mining starts in this widespread mineralized area, a high quality roadway will have to be maintained through the Basin Route. Such a highway would have approximately the same effect on the environment as the Interstate now being considered. Also, if the Basin Route is selected at this time, there would be no damage to the areas covered by the other two proposed routes.

There is another item of great importance to other economic fields, and that is the proposed Port of Butte which will result in lower freight rates in the western part of Montana. Such reduction in freight rates could help to stimulate the phosphate mining and manufacturing industries and could give defenite potential to other industries, such as a wool processing plant. These small industries could be initiated not only in the Butte area, but in the entire southwestern part of Montana. The secret to these potential additional industries, with increased payrolls and taxes, lies in Butte becoming a junction of the north-south and east-west Interstates.

May I request you gentlemen to consider the above facts and may I urge you to accept the Basin Route for I-15.

Very truly yours

Francis M. Young, P.E.

SKYLINE SPORTSMEN'S ASSOCIATION, INC.

P. O. BOX 173 BUTTE, MONTANA 59701

June 28, 1972

Montana Highway Commission
Helena, Montana

Gentlemen:

We prefer the route through Boulder River and Basin because it will have less impact on wildlife than either of the other two proposed routes. We have opposed the Nez Perce route from the beginning because it divides an important elk calving ground. The Whitetail route divides an antelope range and an elk migration route.

We realize that the Boulder River-Basin route would impair fishing habitat in Bison Creek and Boulder River, but mining activities along this stream have already damaged it, and the road would not decrease it very much more. When the new highway is constructed we request that all channel changes be designed with fish habitat in mind, and that all channel changes should have natural appearing bends and not long, straight canals. In time, if silting diminishes, this could again become an important trout stream.

As a road to Basin shall continue to be maintained, this one road should also be used for the through highway, thus obviating any additional roads.

Very respectfully,

SKYLINE SPORTSMEN'S ASSOCIATION

D. Roscoe Nickerson
Secretary

14

Joseph A. Kissock
Chairman
Earl J. Holman
Lucille C. O Leary

Maureen Pasco
Secretary

COUNTY COMMISSIONERS
BUTTE, MONTANA

June 26, 1972

H. J. Anderson
Director of Highways
Montana Highway Dept.
Helena, Montana 59601

RE: ROUTING OF INTERSTATE 15

Dear Mr. Anderson:

It is the unanimous opinion of the Board of County Commissioners of Silver Bow County, Montana that the best interests not only of the people of Silver Bow County, but also of most of the people who, in one way or another, will be affected by the proposed highway, that the Basin Route more or less paralleling or following present U.S. Highway 91 be selected and determined as the site for Interstate 15 between Butte and Boulder.

The Basin Route was first chosen for the Interstate Route many years ago. We believe it would be a great and unconscionable waste of time and money for this route and plan to be changed now. Much time and money have already been invested in the engineering costs for this Basin highway Route and much money and effort have already been spent in acquiring property for the right-of-way in the Elk Park area.

Butte is the hub of business, industrial, and transportation activities in the area. It would be sheer folly to route the Interstate away from the great population center of Butte. The purpose of Interstate highways was to provide efficient, fast, safe means of transporting goods and people from one population center to another.

The traveling and shipping public require ~~fro~~ FoR their convenience services which can be met in this area only by the city of Butte.

Butte and Silver Bow County already have many transportation and warehousing facilities including the Butte Industrial Park. Butte is the natural and logical focal point for the north, south, east, west Interstate intersection, and the route from Butte through Basin to Boulder and Helena is the most logical beneficial route.

The environmental impact of the Butte, Basin, Boulder Route would disturb little or nothing of ~~naute~~ NATURE since highway 91 and the Great Northern Railroad already run through most of the route.

The Board of County Commissioners of Silver Bow County strongly urge all possible support be given the selection of the Butte, Basin, Boulder Route for Interstate 15.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS
SILVER BOW COUNTY, MONTANA

Joe A Kessock
Lucille O. O'Leary
Earl J Holman

19

COMMUNITY ORGANIZATION
JACK HANLEY, Director
107 EAST GRANITE ST. • P. O. BOX 184 • PHONE 792-9164
BUTTE, MONTANA 59701

June 15, 1972

Montana Highway Commission
Helena, MT 59601

Gentlemen:

Butte, Montana, selected as one of 150 cities in the United States to receive Model Cities funds, was selected on one of the premises of helping the city to help itself. There were many other reasons to include enforced idleness, economic imbalance, urban blight, etc.

The Butte Model City concept demonstrated its progress in two short years and was, in addition, selected to participate in another federal derivation of the Model City concept called Planned Variation, which further doubled the amount of federal funds, and was extended to include the remaining portion of the city of Butte. I might add that only 16 cities in the nation were selected to receive this process.

This success in three years was based on the cooperation of City Council, Mayor Micone, the Model City staff, and many hundreds of citizens in city, county, and other community affairs. These citizens spend many hours of volunteer time evenings and weekends during the month to help their community progress. My job is the Citizen Participation and Involvement Coordinator and my testimony is germaine to their wishes.

Of all the groups of citizens that have been established in our community, the number one priority has been "the generation of jobs" and generation of other projects related to jobs to upgrade the citizen and bring him from the enforced idleness situation in which he finds he is presently existing.

One of the major turning points the citizen has realized is our Industrial Park which now is in the making in our community. This project, which now borders on the rim of expansion to actually realize these jobs, has one phenomenal selling point. That is that our community is or will be one of the crossroads in Montana, with Interstate 15 forming the junction in our community.

We respectfully request the State Highway Commission to not defray these plans that have been developed over the years, as we feel the

Funded by: Model Cities Agency
Community Action Agency
Sponsored by: Neighborhood Council
Joint Board of Directors

economic impact on our community just when it is in the crawling stages, will have such undesirable effects that our community will not maintain the trend it has developed; the apathetic mood will once again be predominant; and Butte will host another one of its major priorities that is either ignored or dissolved. We feel this will result in the same situation we had existing prior to the influx of efforts on behalf of our community and the citizens themselves to help themselves.

Your wholehearted cooperation in the effort to retain the Interstate 15 Junction in our community is sought on behalf of the residents who have unselfishly given of their time to help our community progress.

Yours very truly,

Jack Hanley

Jack Hanley
Director

JH:re

My name is Walter G. Kelley, I am Assistant Vice President of The Montana Power Company.

We are seriously concerned with the routing of Interstate 15 because of the scope of our business north of Butte and the shortest route to Helena and Great Falls, where seven of our dams are located.

Many Montana Power people travel north in connection with power operations or the gas fields in the Cut Bank area. Most of that travel is by automobile. As the Montana Power Company headquarters, Butte also is the distribution point for heavy equipment and supplies trucked to the northern properties. The extra mileage, wear and tear on cars and trucks plus time involved is a considerable factor, should an alternate route be adopted.

Approximately 400 people are employed here, many own their homes and have a considerable stake in the city. The same is true of the Company. Therefore, the economic welfare of Butte is critical to both the Company and its employees. For this reason it is important that Butte not be bypassed in any sense which may adversely affect the commercial or mercantile or tourist trade activities.

Finally, Montana Power has been a citizen of Butte for 60 years so that our credentials of interest and concern in this city have been well tested and proven through that long span of time.

Montana Power therefore supports the Basin route and opposes Nez Perce and Whitetail alternates.

Walter G. Kelley
Assistant Vice President
The Montana Power Company
40 E. Broadway
Butte, Montana 59701

butte local development corporation

BUTTE LOCAL DEVELOPMENT CORPORATION PRESENTATION
BEFORE THE HIGHWAY DEPARTMENT'S
HEARINGS IN BUTTE AND BOULDER
JUNE 28 and 29, 1972

The Butte Local Development Corporation is highly concerned about the delay in construction and possible rerouting of Interstate 15 between Butte and Boulder.

The Butte Model Cities Program, controlled by the citizens of Butte, has designated economic growth and diversification as the most important goal of the Program, and has allocated the LDC an annual budget of $620,000. Total LDC budget for industrial development through FY73 is $1,782,000. A $35,000 study supported by the Economic Development Administration outlined the feasibility of establishing Butte as a transportation and distribution center. We have built a $579,000 industrial park to capitalize on this opportunity, and are spending over $55,000 on promotional brochures which have gone to 7,000 companies throughout the United States.

We are in the process of locating several major distribution facilities in the Industrial Park. The first of these will be under construction this summer and will have a very significant impact on Butte's economy. These facilities have the potential for creating 300 new jobs directly, will guarantee vastly improved rail and truck service and lower rates, and will give the LDC a strong sales appeal to hundreds of importing and exporting firms who may establish distribution or assembly facilities.

We expect distribution facilities to free Butte from her tradition dependence on mining and to become the basis for a healthy period of economic growth and diversification. The resulting improvement in rates and services should have a major effect on Montana's development potential.

Let me summarize:

- We see in warehousing and distribution an opportunity for economic growth in Butte.
- We have spent a great deal of money to capitalize on this opportunity.
- We are not talking dreams, we are talking reality. We expect to see the first construction on these facilities in 1972.

All of these plans are based heavily on the intersection of the interstate highways in Butte. The reasons we are being successful in developing this concept are:

1. Butte offers excellent transportation facilities, including intersecting interstate highways and service by three national rail carriers.
2. Cost of distribution through Butte will be lower.

If the intersection were to be moved, Butte would suffer a double penalty:

First, we would lose the strong sales appeal of the intersection of interstates, which is very important to distribution-oriented prospects.

Second, the additional mileage would raise costs, thereby eliminating a significant portion of our appeal.

We are well-launched into a heavily-funded, community-supported campaign to develop Butte as a major distribution center. We are having phenomenal initial success, and expect distribution to be Butte's second largest industry within five years.

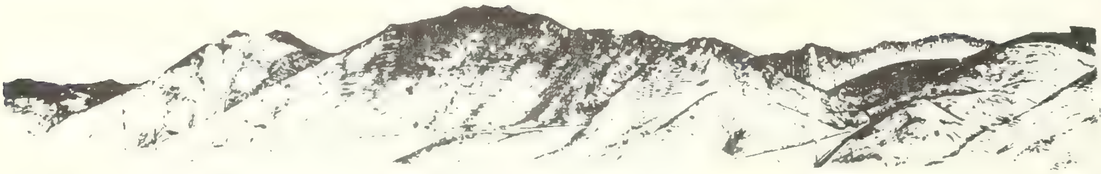
The people of Butte need this highway, and need it now. It is the key to our growth at a time when we are in a position to grow.

My name is Harry Miller; I am the director of the Magicland Council which was formed six years ago to promote the economy of south-western Montana. The Council is composed of the following counties: Deer Lodge, Powell, Granite, Silver Bow, Beaverhead and Jefferson. The primary efforts of the Council have been to promote tourism in the area. The extent of tourism depends primarily on the availability of good roads. The communities in this area that are served by interstate routes have shown a tremendous growth in the number of tourists visiting these respective communities. With the completion of Interstate 15 from Idaho to Canada, we can expect a vast increase in the number of tourists who will be visiting southwestern Montana.

At its last meeting the Council went on record favoring the route from Boulder to Butte via Basin for the following reason: this would be a direct route from the state capital to Butte and would follow a scenic route which would open up a vast recreation area to the visitor.

The Council urges the favorable consideration of the route from Boulder to Butte via Basin and asks that any decision regarding the route be made as soon as possible so as to insure new and more dollars to be generated into this area.

Intermountain Trucking Co. 2905 MOULTON ST. TEL. 792-6663



BUTTE, MONTANA

June 23, 1972.

Montana State Highway Commission
Helena, Montana.

Dear Sirs:

On behalf of myself and other petroleum and fuel distributors and consumers in the Butte area, I wish to be on record as opposing any change in the proposed Butte Boulder via Basin Highway route. We are opposing the suggested Whitetail Route between Boulder and Butte, because of the additional round trip of seventeen extra miles and the more rigorous terrain which would cause extra ordinary tougher pulls, more gear shifting, resulting in loss of time, money and higher operational costs.

Based on 1971 figures of the Montana Petroleum Association, there are about fifty-one million gallons of gasoline, diesel and burner fuel, delivered into Butte from Helena via Boulder, Basin routing. Using the Montana Railroad Commission Published Rates for gasoline and diesel fuels the additional 8½ loaded miles would amount to approximately $48,000 of additional costs to use the proposed Whitetail routing. I Believe this would be detrimental to all concerned.

Very truly yours,

Thomas F. Kenneally

Thomas F. Kenneally.
President

My name is Shag Miller, I am president of the Butte Chamber of Commerce representing a group of more than 700 business and individual members. Our organization, like all residents of our community, is vitally concerned in this proceedings and the threat which hangs over the economic well being of our city and the rest of southwestern Montana.

The Interim highway act of 1950, which established the Interstate highway system, designated Butte as a junction city of interstate highways 15 and 90. It was the original intention of the act to connect major points in the Unted States to service the growing use of the highway system and to implement our national defense. This system is progressing and the service to the people is increasing. Tow

Three plans have been listed to be part of this hearing to determine the route between Butte and Boulder on Interstate 15. Route Hearings were held in 1965 and a route running from Boulder through Basin thru Elk Park to Butte was selected. I have received estimates that more than 5 million dollars has been spent to date on this route in construction, design and planning. The Butte-Boulder segment of I 15 has been held up pending the outcome of these hearings before a route is finally dedicated. Testimony and evidence presented here tonight, as well as reams of prepared statements and extensive studies show that the delay caused by this proceedings is prompted by the selfish interest of a few against the desires and needs of the majority of the people residing in the area and the visitors and users of the highway system. We hold no quibble with the Basin or Nez Perce

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route...but we vehemently in the strongest words and action oppose any consideration of the proposed route that would take I-15 out of Butte and put the junction in Pipestone. This action would violate the complete intent of the Interstate Highway Act and would not be a road connecting Helena and Butte but would be connecting Helena and Pipestone Hot Springs.

As many people know one of the purposes of this hearing is to consider the ecological impact of the route to be selected. We admit there is some environmental damage when any road is constructed but if this is the true critera then logically the road should be built in Ekalaka....but that would not serve the people in this portion of the state. I have seen the plans and design for the proposed route through Basin...and environmental adjustments have been worked out to afford the greatest ecological protection and at the same time provide service to the people. Frank Dunkle, Dunkle former director of the Fish and Game Department, said in public statements he was satisified with the provisions worked out with the highway department to protect the stream areas involved and the plans made with the forest service to protect recreational facilities. Sections of the proposed routing take you through some of the most picturesque area in southwestern Montana. These should be available for all to see and enjoy. The pleasure offered the people is one ecological point which can not be overlooked. I site the magnificent road on interstate 15 passing through the wolf creek canyon....it can not be matched anywhere for beauty and for scenery.

Dunkle Statements

The proposed routing of Interstate to Butte through either Nez Perce or Basin affords more access to recreation areas and enables the citizens regardless of his income a better opportunity to use these wonderful facilities at a lower cost. This is another ecological plus. I could go on here at length to document the economic aspect of the route and it's importance to our community. Most of this w~~ill~~ has been be covered by other witnesses. But I might add the future of Butte is connected with the interstate highway system and the junction of Interstates 15 and 90 is imperative. The Port of Butte plan is dependent on it. Our distribution system is dependent on it for only Butte has three transcontinental railroads serving it and has been dedicated as a junction of Interstates 15 & 90. People and jobs are dependent on it! And to Montana's fragile economy, jobs are the most important thing to all of us.

I am in the radio broadcasting business in Butte and we by the receipt of federal license are required to serve in the public interest, convenience and necessity. I think this is a most noble and beneficial responsibility. All government agencies and those franchised organizations are required to serve in this same capacity of the public interest convenience and necessity. It is the duty of the highway department, fish and game department, Federal highway administration and the Environmental protection agency to keep this principle in mind as they make the vital decision on the selection of the route of Interstate Highway 15. The public interest, convenience and necessity of all the people.. not the few must be the criteria for the benefit of those who live, work and enjoy the beauty of our treasure state now...and those who will do the same in the generations to come.

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FRANK DUNKLE

REPUBLICAN CANDIDATE FOR GOVERNOR

March 27, 1972

Frank Dunkle, Republican candidate for governor was a visitor here in Butte and stopped by KBOW.

MR. MILLER: "Good to see you, Frank. How's the political campaign going?"

MR. DUNKLE: "Hi, Shag. It's nice to be in Butte; and the campaign is going swift, talking with lots of people, I hope presenting them with a program they'll find acceptable and one they'll like to see carried out in the state of Montana."

MR. MILLER: "One question that is concerning alot of people in our area is this Environmental Impact Study of the route of Highway 15 between Boulder and Butte. You're acquainted with this particular problem."

MR. DUNKLE: "Shag, I have to tell you the same thing I have been saying and would have said when I was with the Department of Fish and Game, and that is the routing had been established prior to the Environmental Impact Study Law. The routing had been determined. The Fish and Game Department and the Highway Department had worked closely together under the Stream Preservation Act to see that recreational needs

32

were best met and that any loss would be regained through channels that would be recut by the highway; and considerable money has been put into the routing, both from the starting point and the ending point here at Butte and then at Boulder. It would seem to me in the best interest of serving the two communities, Helena and Butte, and in keeping with the monies that are being spent with the decisions that were made, the routing should still go the same way; and I'm sure that the Butte people would give considerable backing to the Game Department to see that the needs for the stream and recreational parts of the alignment through Boulder, Basin, Butte would be made. I would say that the decision was made and should be honored."

MR. MILLER: "Fine. Thank you very much. Talking to Frank Dunkle. Shag Miller, KBOW News."

28

100 EAST BROADWAY • PHONE 723-6535 (AREA CODE 406) • BUTTE, MONTANA 59701

BCC
BUTTE
CHAMBER
of COMMERCE

ANA HIGHWAY COMMISSION
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MATERIALS
PRECON. SECTION
RIGHT OF WAY
GROSS VEHICLE WEIGHT
LEGAL
MAINTENANCE
MOTOR POOL
PERSONNEL
OTHER

July 7th, 1972

Mr. H. J. Anderson
Director of Highways
Highway Department
Helena, Montana 59601.

RE: HELENA-BUTTE INTERSTATE 15

Dear Mr. Anderson:

In the interest of the future of the City of Butte, Silver Bow County, the State of Montana and the national interest in addition to and supplementing both oral and written information previously submitted at numerous meetings and the two public hearings in Butte and Boulder on Interstate 15 routing, and with apologies, for no doubt some repetition we would appreciate having you consider the contents of this letter and have it made a part of the record.

In the first instance we would like to thank you, your staff and other personnel who have been involved in the matter for the consideration, time, attention, cooperation and information provided to help present our case for an Interstate routing from Helena south direct into Butte either via Nez Perce or Basin.

We believe we have made it abundantly clear, and not without justifiable reasons, that we are unalterably opposed to a Whitetail routing. It would be a crushing and disastrous blow to the economic future of Butte and Silver Bow County which in turn will reflect itself measurably in adverse effects on the entire State of Montana's future well being which in turn reflects itself on the national interest.

We in all earnestness submit to you our firm, honest and fair-minded contention that the very foundations of the Interstate system, the basic laws and reasons behind the system, call for a routing direct into this community as opposed to by-passing it by some 17 miles to the east.

In respect to our position we urge the relevancy of language used in the highway law concept and take the liberty of quoting portions of the law from The Code of the Laws of the United States of America on Highways, originally enacted into law by Public Law 85-767, Sec. 1, August 27, 1958, 72 Stat. 885 and later amended, now cited in Title 23, "Highways," U.S.C.A. Secs. 101, 201 and 301, et. seq. (Underline on following quotes ours.)

The Home of Montana Tech

Sec. 101, P. 9. Definitions and declaration of policy.

"* * * Since many of such highways, or portions thereof, are in fact inadequate to meet the needs of local and interstate, commerce, for the national and civil defense."

"* * * Insofar as possible in consonance with this objective, existing highways located on an interstate route shall be used to the extent that such use is practicable, suitable, and feasible, it being the intent that local needs, to the extent practicable, suitable and feasible, shall be given equal consideration with the needs of interstate commerce."

Sec. 103, p. 13. Federal-Aid systems.

"* * * The Interstate System * * * shall be so located as to connect by routes, as direct as practicable, the principal metropolitan areas, cities, and industrial centers, * * *."

Sec. 134, P. 66. Transportation planning in certain urban areas.

"It is declared to be in the national interest to encourage and promote the development of transportation systems, embracing various modes of transport in a manner that will serve the states and local communities efficiently and effectively * * *."

Sec. 105, p. 16, 1972 P.P. Programs.

(g) "In preparing programs * * * State highway departments shall give consideration to projects providing direct and convenient public access to public airports, * * * and in approving such programs the Secretary shall give consideration to such projects."

Sec. 109, p. 20, 1972 P.P. Standards.

(h) "* * * shall * * * promulgate guidelines designed to assure that possible adverse economic, social, and environmental effects relating to any

> proposed project on any Federal-Aid system have been fully considered in developing such project, and that the final decisions on the project are made in the best overall public interest, taking into consideration the need for fast, safe and efficient transportation, public services, and the costs of eliminating or minimizing such adverse effects and (as)the following:
>
> (1) Air, noise, and water pollution;
>
> (2) Destruction or disruption of man-made and natural resources, aesthetic values, community cohesion, and the availability of public facilities and services;
>
> (3) Adverse employment effects, and tax and property losses;
>
> (4) Injurious displacement of people, businesses, and farms; and
>
> (5) Disruption of desirable community and regional growth. * * *"

With the foregoing in mind we respectfully submit that the contentions of environmental opponents of the Basin route are far outweighed by all other factors involved especially when cognizance is taken of the fact that the present U. S. 91 and the railroad through the Basin route have long since had their effect on the environment and Interstate 15 would not alter present conditions to any appreciable degree.

It would be a complete disservice to the very bases of local needs, connection of cities by routes as direct as practicable, service to local communities efficiently and effectively, providing direct and convenient public access to public airports, community cohesion, availability of public facilities and services, adverse employment effects, tax and property losses; injurious displacement of people and businesses and disruption of desirable community and regional growth, for Interstate 15 from Helena South via the Whitetail route to by-pass us by some 17 miles. We earnestly urge that all of the foregoing considerations, reasonably and in all justice call for the routing direct into Butte, Montana. Butte is justified from all aspects in seeking and urging that routing. Butte needs it, Silver Bow County needs it, the State of Montana needs it and the national interests will also be better served by it.

As this is being presented to you by the Chamber of Commerce of Butte, Montana, the question comes up--just who or what is the Chamber. It is a vital segment of the community speaking for and on behalf of individual citizens, laborers, professionals and businesses, real, live people, taxpayers, wage earners, each of whom together make up the Chamber. They total some 678 persons representing 415 businesses and 203 individuals. They live in and depend upon the economy of Butte and Silver Bow County and make up a part of Silver Bow County's population per the 1970Census of 41,981 people. These people are looking forward to Interstate 15 direct into Butte from Helena on the basis of clear and undeniable justification based on sound facts, reasons and judgment.

In further support of the foregoing and our position the Chamber staff has developed and condensed the following pertinent information relative to the Butte area for your consideration:

Relative to sub-paragraph (3) of Sec. 109, supra, as to tax losses the following figures represent the amount of taxes paid by individuals, industries, corporations and partnerships of Silver Bow County to the State of Montana for the fiscal year of 1971:

Income Tax...............$	2,600,000.00
Gas Tax..................	1,879,000.00
Metals Mining Tax........	1,950,000.00
Liquor Tax and License...	724,000.00
Beer Tax and License.....	96,000.00
Cigarette Tax............	276,000.00
Other miscellaneous Taxes	1,600,000.00
Property Tax (6 mill levy)	246,000.00
TOTAL...................$	9,371,000.00.

Present indications are that for the current year the comparable 1972 figures will be approximately 10% ahead of 1971, thus potentially increasing the above total by about a million dollars.

Conceivably of more importance due to the high ratio of Federal funds involved our best information indicates that for the year 1971 individuals only in Silver Bow County filed 17,577 Federal Income Tax returns (includes joint returns) which reveal a total individual Federal Adjusted Gross Income of $117,889,781.00 on which Federal Income Taxes of $16,616,852.00 was paid.

Again referring to sub-paragraph (3) of Sec. 109 on property losses, for the fiscal year 1972 the taxable valuation of Silver Bow County is $54,238,735.00 with an assessed valuation of $170,542,965.00.

Looking at the community picture from a standpoint of the guides in Sec. 109 sub-paragraphs 3, 4 and 5, "adverse employment effects," "injurious displacement of people and business," "disruption of community and regional growth," the Butte area has a Total Labor Force (people working and looking for work) of 16,020 with 15,060 total employed covered by Unemployment. In addition there are 884 Employers in the area protecting their employees with Unemployment Coverage. Some 1,100 persons are employed in service industries.

Of further importance, in line with the Code guide lines cited, on the availability of public facilities and services, the Butte area has in operation 2 major Hotels, 17 Motels, with a new 106 room Motel in process of construction on Harrison Avenue, Restaurants number 39 and there are 45 Service Stations available.

Augmenting the above and as a major factor to be protected and serviced in the present day scheme of transportation of the public the Silver Bow County Airport serves general aviation and Northwest and Western Airlines with the year 1971 showing boardings at Butte in the amount of 37,157. As we have previously pointed out Sec. 105, "Programs," supra, shows the intent and specifications passed by the representatives of the people to the effect that consideration shall be given to providing direct and convenient public access to public airports.

Costs of construction must of course be taken into consideration. We cannot vouch for the accuracy of the following figures but our understanding from information given us indicates the following:

1. With $15,430,755.00 of construction let to bid on Interstate 15 from Dillon north to Butte should the Whitetail route go through the next logical move south would be Twin Bridges to Dillon, therefore the 15 million though

perhaps not an entire loss would be a major and wasteful duplication of tax dollars.

2. On the three routes under consideration the construction cost figures appear to be as follows:

(A) Nez Perce Route.......$	29,226,000
Cost to update U. S. 91.........	3,500,000
$	32,726,000
(B) Basin Route...........$	31,996,000
Less amount already spent.......	5,457,000
$	26,539,000
(C) Whitetail Route.......$	18,485,000
Cost to update U. S. 91.........	6,000,000
$	24,485,000
(D) Estimated present annual maintenance on U. S. 91 which would necessarily continue$	58,000
10 years maintenance estimated..$	700,000.

Based upon the foregoing estimated calculations it would appear that after deducting 10 years maintenance on U. S. 91 the Basin Route direct into Butte would cost only $1,354,000.00 more than the Whitetail Route. Relate this figure back to the tax figures above supplied coming out of Silver Bow County annually - roughly 10 million to the State of Montana and over 16 million to the Federal government, a total of over 26 million dollars. Admittedly it is speculative; however, the potential tax loss consequences involved, if Interstate 15 were to by-pass Butte on the Whitetail Route with its junction about 17 miles to the east on the opposite side of the Continental Divide completely overshadow the slightly higher construction cost.

In conclusion we hereby respectfully request, based upon sound reasoning and the pertinent facts herein set forth, that Butte and Silver Bow County be not by-passed, that the Whitetail Route be abandoned and a direct route from Boulder into Butte be again adopted, accepted and approved.

Sincerely yours,
Butte Chamber of Commerce
By: Shag Miller
President.

INTERNAL MEDICINE:
J. E. McGreevey, M.D.
J. L. Patterson, Jr., M.D.

PEDIATRICS:
D. L. Gillespie, M.D.

MURRAY CLINIC
NINE WEST GRANITE
BUTTE, MONTANA 59701
PHONE 723-5474

OBSTETRICS & GYNECOLOGY:
T. H. Strong, M.D.
R. E. Nehls, M.D.

SURGERY:
W. A. Burke, Jr., M.D.
R. J. Best, M.D.

June 27, 1972

Re: Hearings on the route
determinations for Interstate 15
between Boulder and Butte

Highway Commissioners
Helena, Montana

TO WHOM IT MAY CONCERN:

I am addressing you as a citizen of Butte, and also giving the viewpoint of one who is conservationly oriented.

As to the former qualification, I have resided and practiced in Butte since 1957, and have been a member of, and participated in, various civic organizations including the Butte Chamber of Commerce.

> I believe as a citizen of the Butte and Anaconda metropolitan area, that the current road servicing this region to Helena, via Boulder, has deteriorated into an extremely dangerous passage. Should the interstate not follow the current routing (via Basin), U. S. 91 will have to be reconstructed to support modern transport demands--and this will cause or require some re-routing because of the change in standards of current road building.

As a practicing physician I am quite aware of the importance and the impact of the environment on the health and well-being of the human being. I am a member of several conservationly-oriented societies and organizations including the National Audubon Association, U. S. Wild Life, American Forrest Association, Smithsonion Association, American Museum of Natural History, and the Montana Wilderness Association. I am abreast of the changes that are proposed and are evolving, as far as man and his relationship to his environment is concerned.

> From the environmentalist or conservationist viewpoint, it would appear to me that the opponents to the routing of the interstate through Basin have selected the wrong area to make their stand. This area has already had a marked environmental impact over the last 75 years, not from just highway transportatio but from railway transportation and mining of nearly every gully and gulch along its path. The Boulder River and Basin Creek are not blue ribbon trout streams, nor is this an area of pristine qualities, because of man's activity in the last 75 years. It is an attractive area to drive through but as noted above, man's impact is noticed along nearly every mile of transit; an interstate highway constructed in cooperation with the Montana Fish and Game guidelines, so that there is minimal, if any, polution of the streams involved, should have no significant detrimental effect on the environment.

Either of the two alternative routes would certainly have a significant impact on the environment that is not currently present.

J. L. Patterson, M.D.

JLP:dh

P. S. It is unfortunate that current economics will not permit the construction of attractive - and less destructive - bridge spans and tunnels rather than fills and gashes.

RESOLUTION NUMBER 5186

WHEREAS, Highway I-15 of the federal interstate highway system is presently under construction; and

WHEREAS, part of said highway as presently located and designated passes through the City of Butte and continues north and south from said City; and

WHEREAS, the route for said highway north from the City of Butte to Boulder, Montana, is now under consideration by the Montana Highway Commission; and

WHEREAS, the Butte-Basin-Boulder route through Elk Park and the Bison Creek and Boulder River canyon, via Basin, Montana, has previously been approved by the Montana Highway Commission as the most feasible route for said I-15, and land acquisition and surveys for said route has commenced; and

WHEREAS, said Butte-Basin-Boulder route will most advantageously meet the best interests of the residents of the area served by said route, and will meet environmental requirements; therefore

BE IT RESOLVED, that the Butte City Council supports and urges that Interstate Highway I-15 continue north from Butte through Elk Park, via Basin, Montana, and then to Boulder, Montana, and that this route be approved by the Montana Highway Commission and appropriate federal authorities.

BE IT FURTHER RESOLVED, that copies of this Resolution be sent to the Honorable Forrest Anderson, Governor of the State of Montana; the Montana Highway Commission; and the Montana Congressional Delegation.

Dated this 21st day of June, 1972.

Passed the 21st Day of June, 1972, Approved this 22nd Day of June, 1972

Mario Micone
Mayor

ATTEST:
City Clerk

MONTANA HIGHWAY COMMISSION
RECEIVED
SEP - 4 1973
HELENA, MONTANA

BOULDER AREA CHAMBER OF COMMERCE
BOULDER, MONTANA 59632

H.J. Anderson,
Director of Highways
Montana State Highway Department
Helena, Montana 59601

Dear Mr. Anderson;

The officials and members of the Boulder Area Chamber of Commerce, located at Boulder, the County seat of Jefferson County, Montana, feel it is of the utmost urgency that the proposed Boulder-Basin-Butte interstate route be recommended as a continuation of I-15 routing south of Boulder.

As the south Boulder valley is a highly productive agricultural area, and it is not a wide valley, a four lane highway would be very disruptive to the operation of the ranches and, in turn, very disruptive to the economy of the Montana and the Boulder area. A north Boulder drainage district has been formed to construct a dam for the purposes of additional irrigation in the valley and for recreational purposes. Particularly in this day and age, every available means should be considered to increase the production of food which has been in such short supply and apparently will be in the future years.

As to the wildlife and fish habitat, an interstate highway through the Boulder valley would seriously disturb herds of antelope and deer. We, with the Boulder valley ranchers, feel that starvation would be common if the wildlife were not allowed access to fields of alfalfa and creasted wheat.

Also, fishing is much better from Boulder south through the valley area. It is a known fact that the tailings from the mining operations of the Basin area have greatly affected the fish life in the Boulder River. The suggestion here is that these tailings and dredging remains can provide, not only materials for the road bed, but also in effect, clean up the polluted Boulder River thus providing better utilization of these waters.

We also feel, as do the civic leaders of the Helena and Butte areas, that the interstate routing should be designed to accommodate the majority of our population. To by-pass the city of Butte, we feel, would be highly detrimental to the economic interests' of the Helena-Butte area, as well as the Boulder area.

We, the Boulder Area Chamber of Commerce, strongly urge you to recognize the town of Boulder as the County seat of Jefferson County, and that the routing of the interstate through the Boulder valley would by-pass the only two incorporated towns in Jefferson County - Boulder and Whitehall.

Your immediate consideration to this matter would be greatly appreciated,

Sincerely,

Joe Miller

Joe Miller, President

John M. Franchi, Board Chairman

kp

Soroptimist International Association
AMERICAN FEDERATION OF SOROPTIMIST CLUBS
P.O. Box 3364
Butte, Montana 59701

July 10th, 1972

MONTANA HIGHWAY COMMISSION
RECEIVED
JUL 1 [illegible] 1972
HELENA, MONTANA

MONTANA STATE HIGHWAY DEPARTMENT
Helena, Montana 59601

Gentlemen:

Why do you want to change Interestate #15? Is this supposed to be progress?

The route between Helena, Basin and Butte is very scenic--a highway that tourists will enjoy to the utmost.

This interstate has served the people very well, and is the only sensible route for Interstate #15. So why try to relocate.

The Butte Soroptimist Club supports the original Interstate #15.

Yours very truly,

BUTTE SOROPTIMIST CLUB

Mary T. Malyevac
Mary T. Malyevac
First V-Pres.

RETURN TO	MAY BE RETAINED	DIRECTOR		CENTRALIZED SERVICES	ACCOUNTING	DATA PROCESSING	PLANNING & RESEARCH		ENGINEERING	PRECON. BUREAU	BRIDGE	CONSTRUCTION	MATERIALS	PRECON. SECTION	RIGHT-OF-WAY		GROSS VEHICLE WEIGHT	LEGAL	MAINTENANCE	MOTOR POOL	PERSONNEL		OTHER
INF		✓																					
ACT																							

June 29, 1972

Mr. H. J. Anderson, Director
Montana Highway Commission
Helena, Montana 59601

Dear Mr. Anderson:

I have been an elementary principal in the Butte school system for eleven years, and during that time the people of Butte have supported their school system.

Due to the rising cost in property taxes for schools, various sources of income for schools has been sought. With the Interstate 15 using the Basin-Boulder route, this will bring economic growth to the city of Butte and therefore help the taxpayers of Butte who have put themselves out to support their school system.

Usually, when people are relocating for business reasons, their primary concern is what type school system their children will be coming into. Butte has taken a back seat to no school system in the state of Montana, but I believe with the new additional economic base, we could have an even better school system to induce people to come in and relocate.

Sincerely yours,

James F. O'Dell

James O'Dell, Principal
Whittier School

JO:eb

2

MONTANA
MOTOR
TRANSPORT
ASSOCIATION INC.
LEONARD W. ECKEL, MANAGING DIRECTOR
1727 11TH AVENUE, HELENA, MONTANA 59601
TELEPHONE AREA CODE 406-442-6600

June 29, 1972

Montana State Highway Commission
Capitol Complex
Helena, Montana 59601

Gentlemen:

Please consider this letter an official protest by the Montana Motor Transport Association, Inc. to the proposed Nez Perce or Whitetail route between Boulder and Butte. We have many objections to the Nez Perce route. Nez Perce pass, according to the information we have received is about 1000 feet higher than the pass near Woodville. We have a lot of truck traffic between Helena and Butte and we are further told that the Nez Perce is said to embrace about 13 miles of 5% grade on the north side of the pass plus some on the south side.

After considerable study we believe that it would be more feasible and economical from the motor carrier's standpoint that the new route be built between Boulder, Basin and Butte.

We certainly hope that you will give this letter your every consideration and if in the future any more public hearings on it are to be held, will you please let us know so that we may be represented by counsel in protest to the Nez Perce highway.

Very truly yours,

Leonard W. Eckel

LEONARD W. ECKEL
Managing Director

LWE:mes

MEMBER ATA
REPRESENTING THE TRUCKING INDUSTRY IN MONTANA

The Anaconda Company
SIXTH FLOOR HENNESSY BUILDING
POST OFFICE BOX 689
BUTTE, MONTANA 59701

OFFICE OF
[redacted]
Manager-Butte Operations

June 23, 1972

Montana State Highway Commission
Helena
Montana

Gentlemen:

In recent weeks there have been rumors that The Anaconda Company is opposed to the routing of the Interstate Highway through Butte. This is completely untrue. To date, we have neither opposed nor promoted any route, although we have stood ready to support whatever is determined to be best for our community.

The policy of The Anaconda Company is to promote and improve the community within which we operate. Thus, we are solidly in support of anything that will benefit Butte and its people, and we are just as strongly opposed to anything that will hurt Butte.

We are very interested in the betterment of Butte. We encourage new industry to locate here. We will support any worthy project to improve economic conditions in Butte and make a better community for our employees and all other citizens.

Therefore, since the routing through Butte appears best for this purpose, and in favor with most of the people in this area, The Anaconda Company endorses and joins with its fellow citizens in support of this route and against the proposed Whitetail Route.

Very truly yours,

Frank M. Monninger

Frank M. Monninger
Manager-Butte Operations

FMM:ln

Magicland DEVELOPMENT CORPORATION
P.O. BOX 231 / TELEPHONE (406) 563-3307 / ANACONDA, MONTANA

June 28, 1972

Highway Department (Interstate Hearing)
Butte, Montana 59701

BE IT KNOWN TO ALL HERE PRESENT:

The interstate system in total, and its local development and routings in particular, were among prime factors in establishing the feasibility for the multimillion dollar development at Gregson Hot Springs.

Included in the transportation studies of the past four years was an all-important segment of tourist trade which we claimed would traverse the Boulder, Basin, Butte route. Hoping that we have not been in any way presumptuous, we would respectfully seek your indulgence while we intercede on behalf of our proposed recreational complex. At this late hour, an improper decision could generate serious difficulty in the ultimate accomplishment of an on-going, revenue-producing, job-creating bonanza which can only mean improved economic health for the entire business community. Local governments, together with the state administration, would find some resolution to their existant fiscal difficulties, in the resultant economic impact.

We pray that, in your difficult deliberations and decisions, you will continue to keep our most worthy endeavor in your sites at all times.

To date we are most grateful to the entire community which, without exception, has subscrived to the early realization of our "Gregson Dream."

Respectfully,

Tom Powers

Tom Powers
President

TP/mlm

UNITED STATES POST OFFICE

BUTTE, MT 59701

June 29, 1972

IN REPLY REFER TO
AHW:em

Mr. Grover O. Powers, P. E.,
Supervisor-Preconstruction Section
State of Montana
Department of Highways
Helena, MT 59601

Dear Mr. Powers:

With reference to your memorandum of May 31, 1972, I have reviewed the draft environmental statement concerning highway improvement between Butte and Boulder, Montana and have found nothing which convinces me that the Butte, Basin, Boulder route should be abandoned in favor of either of the other proposals.

Speaking as a citizen, this appears to be the least expensive and most accessible route, having a portion of the work completed near Butte and certain lands available from the railroads at nominal or no cost.

Speaking as the Postmaster in Butte, Montana, I find that the other routes would make delivery of mail much more difficult; would eliminate services to small communities and would be considerably more expensive from an operational standpoint.

I would strongly urge adoption of the Butte, Boulder, Basin Route.

Very truly yours,

A H Wilkinson

A. H. Wilkinson
Postmaster
Butte, MT 59701

Date Rec'd Preconst. 6-30-72
Pub Hearings
File

MONTANA HIGHWAY COMMISSION
RECEIVED
JUN 28 1972
HELENA, MONTANA

THE COLONIAL

ce of President
im Babcock

2301 COLONIAL DRIVE, HELENA, MONTANA 59601 • PHONE 443-21

June 26, 1972

RETURN TO M & F
MAY BE RETAINED
DIRECTOR
CENTRALIZED SERVICES
ACCOUNTING
DATA PROCESSING
PERSONNEL
INF
ACT

Mr. Harry J. Anderson
State Highway Engineer
Montana Highway Department
Helena, Montana 59601

Dear Mr. Anderson:

I understand the Highway Department is reconsidering the location of the Butte-Boulder segment of Interstate Highway No. 15. The original decision to locate the new highway roughly on the same route as the present road through Boulder was reached while I was Governor and I am more convinced than ever that the decision was a good one. According to press reports, the Highway Department favors the Basin route and I am writing this letter to you to support that position.

Among the many reasons for selection of the Basin route were environmental considerations. Alternative routes proposed at that time would penetrate roadless areas, with accompanying wildlife damage. No particular environmental advantages were perceived in the alternate routes. At the time, of course, the success of the Wolf Creek segment of I-15 with respect to relocation of Wolf Creek was unknown, but would surely now allay fears that the Boulder would suffer irrepairably by new construction through Basin. Environmental damage would be confined to an area which has been continuously used by man since the early days of the State.

The other reasons for preferring the Basin route were, and are, more obvious. The convenience of a much greater number of persons would be served -- persons who live in the area and persons traveling between major Montana population centers. Several of the alternate routes would travel areas of no present habitation and would serve no local needs. It seems to me that these facts must be taken into account along with environmental considerations.

Kind personal regards,

Tim Babcock

Tim Babcock

TB:jm

PETITIONS

MONTANA HIGHWAY COMMISSION
RECEIVED
JUL 23 1973
HELENA, MONTANA

Boulder, Mont.
July 20, 1973

Mr Jack Beckert
State Supt of Highways
Highway Bldg.
Helena, Mont. 59601

Dear Mr. Beckert:

Enclosed is a copy of a prepared statement by the ranchers in North Boulder Valley in regard to routing of I-15.

When would it be convenient to meet with you in regard to this?

Sincerely,
Mrs. George Lawson
Elva

ACT INF [illegible]
DIRECTOR
CENTRALIZED SERVICES
ACCOUNTING
DATA PROCESSING
PLANNING & RESEARCH
PERSONNEL

North Boulder Valley is a highly productive agriculture area with livestock being the main crop. Most of the ranches are old established ones with some dating back to the 1870's. Some have also been in the same family from generation to generation since that time. The valley is not a wide valley and if a four lane highway was put thru, be it put at the foothills or thru the meadows it would be very disruptive to the operation of the ranches and thus be most expensive to the ranchers and the highway alike. A four lane highway would seriously interfere with the moving of livestock, farm machinery, e

The North Boulder Drainage District has been formed to construct a dam in the Chinese Diggings area for the purpose of additional irrigation in the valley and recreation. If a highway should be put thru it would in all probability go right over the top of the diversion ditch to fill the dam. It looks like in this day and age every available means should be considered to increase the production of food which is getting in such short supply. A four lane highway thru the valley would cause ranchers to have to cut down on production.

As for the valley route being the least damaging to wildlife, some old timers and younger ones, too, do not agree with that thinking. North of Keith Hart's ranch there lies winter range for elk---vacated by the herd because of harassment by snow machines. They've been seen crossing to Galena Gulch and evidence exists that they winter on Bull Mountain causing the numbers of elk to exceed the 200 head limit on Bull Mountain, which [illegible] established by the Fish and Game. This is causing overgrazing of range, one-half of which is private property. The four lane highway going thru Basin would separate these two herds. A highway thru Boulder Valley would surely disturb herds of antelope and numerous deer on the flats and in the foothills. Indeed, starvation would be common if they weren't allowed access to fields of alfalfa and crested wheat.

Over the years the runoff from mines in the Boulder-Basin area has contained concentrations of arsenic. Washed down the river, these waters have killed bushes and trees, thus destroying cover for fish--perhaps numerous fish as well. Fishermen will attest to the fact that fishing is much better from Boulder down the valley than it is from Basin to Boulder. Therefore, it makes better sense to alter the stream where it is already disturbed rather than disrupt the river downstream.

We feel that the route thru Basin would do the least damage all around because of the facts stated above and because there is already a highway and railroad bed there. We also feel that in the end the route thru Basin would be of much benefit to the people of Butte and many others also.

Ernest DeBay
Norman DeBay
Mary Ellen Murphy - M.M. Ranch.
Mr. & Mrs. John Murphy - M.M. Ranch
Larry Foran
Fay Foran
Fred R. Brown
Erich Brenner
Martin Carey
Jack Dawson
Dave Dawson
Josephine Phelan
[illegible]
[illegible]

Paul T. Smith
B. W. Phelan
Emmett McCauley
William F. Ford
Mary McCauley
Tom Carey
Helen Carey
W. L. Dawson
Tom Duncan
[illegible]
[illegible]
[illegible]

ADDENDUM

ward Mulligan

Dawson

eo. Dawson

J. Dawson

Collins

E. Collins

ma Tibay

se Fouts

ean Shaw

Interstate 15 Task Force

100 EAST BROADWAY
BUTTE, MONTANA 59701

[illegible] COMMITTEE
[illegible] CHAIRMAN
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
KARL [illegible]
JACK HEALY
[illegible]
[illegible] HODGE
[illegible] MARIO MICONE
[illegible]
[illegible] C. EGAN
[illegible] HOTTE
[illegible] JAMES SHEA
DR. LEONARD VAINIO

TASK FORCE
FRANK LENICH
[illegible] BROUDY
[illegible] UDY
[illegible] BUHRER
[illegible] BULLOCK
[illegible] BULLOCK
HAZEL CARTER
RAY COLBERT
JOHN CROMER
MYRON CURRIE
J. B. DAVIS
CATHERINE DuBOIS
ALEX C. DUCICH
A. L. DUGGINS
RUDY ENDRESSE
DUANE GLEAVES
RICHARD GRACE
S. I. GROFF
[illegible] HARPER
AL [illegible]
[illegible]
[illegible]
E. [illegible] KELLEY, JR.
TERRY KELLY
JOSEPH KING
DON KNIEVEL
DON R. KNIEVEL
ROBERT KOPRIVICA
ROBERT E. LEE
F. J. LEIPHEIMER, JR.
MRS. F. J. LEIPHEIMER
BRUNO LENCIONI
JOE LESKOVAR
MRS. JOE LESKOVAR
JERRY LOMBARDI
J. D. LYNCH
JUDY MARTZ
J. J. McCAFFERY
D. J. McCAIG
GEORGE McCRACKEN
FRANK MONNINGER
JOHN T. MULLANY
TOM MURRAY
SIG NEWMAN
ROSCOE NICKERSON
ARTHUR PANKEY
FRANCIS PETERSON
MRS. FRANCIS PETERSON
JOHN PRICE
JOE QUILICI
MEL [illegible]
GIL RICHARDS
JIM ROBERTS
LEW RUDOLPH
STEVE RYAN
JOSEPH SOLOGUB
FLOYD STEWART
LAWRENCE STIMATZ
TOM TRACY
LEN WATERS
L. D. WHITEHEAD
LESTER G. ZEIHEN

July 25, 1973

Mr. H. J. Anderson
Director of Highways
Helena, Montana 59601

Re: I-15 BOULDER-BUTTE ROUTE

Dear Mr. Anderson:

In order to point out the interest of the people of Montana in the routing of Interstate 15 from Boulder, Montana south through Basin and into Butte, Montana, the Interstate 15 Task Force circulated petitions to be signed by residents of Montana or licensed vehicle operators, signifying the support of the signers for this route.

Although all of the petitions have not yet been returned, we are enclosing herewith 476 petitions containing 16,775 signatures.

As you will note these signatures are from residents of Butte, Anaconda, Deer Lodge, Helena, Boulder, Basin, and most communities in Montana.

The I-15 Task Force and signers of the petition wish to emphasize that people are the most important part of the environment. A true and proper Environmental Impact Study must take into account ecology, economics, and social aspects.

We trust that the Montana Highway Commission will take the message of the signers of these petitions into consideration when choosing the route for Interstate 15.

Yours very truly,

INTERSTATE 15 TASK FORCE

By
Maurice A. Maffei, Chairman

cc: Hon. Thomas L. Judge, Governor, State Capitol Building,
Helena, Montana

PETITION

0008[illegible]

: MONTANA STATE HIGHWAY COMMISSION
HELENA, MONTANA
U. S. DEPARTMENT OF TRANSPORTATION
WASHINGTON, D. C.

RE: INTERSTATE 15
BOULDER-BASIN-BUTTE ROUTING

The undersigned residents of Montana or licensed vehicle
erators petition for final determination, approval and early
nstruction of routing of Interstate 15 from Boulder, Montana,
uth through Basin and into Butte, Montana, because such routing
uld, among other factors: 1) Best serve local needs; 2) Connect
ties by a route as short as practical; 3) Service local communities
fectively and efficiently; 4) Provide direct and convenient public
cess to public airports; 5) Provide community cohesion; 6) Provide
st availability of public utilities and services; 7) Prevent ad-
rse employment effects; 8) Prevent tax and property losses;
Prevent injurious displacement of people and businesses;
) Prevent disruption of desirable community and regional growth,
d 11) BEST SERVE THE "PEOPLE POPULATION" OF SOUTHWESTERN MONTANA,
EY BEING THE MOST IMPORTANT FACET OF ALL ECOLOGICAL, ENVIRONMENTAL
D SOCIO-ECONOMIC CONSIDERATIONS:

NOTE: This Petition contained 16,773 signatures.

LETTERS OF COMMENT
ON
DRAFT ENVIRONMENTAL
SECTION 4(f) STATEMENT

RECEIVED
1972
HELENA, MONTANA

United States Department of the Interior
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

ER-72/761

Dear Mr. Anderson:

This is in response to your request for the Department of the Interior's comments on the draft combined environmental/4(f) statement for I-15 (Butte to Boulder) in Jefferson and Silver Bow Counties, Montana. Our comments address each component of the combined statement.

Section 4(f) Determination

Based on the information furnished and a field review, the Department of the Interior cannot concur that there are no feasible and prudent alternatives to the selected Basin Route. As a matter of fact, we find that the Whitetail Route is a corridor in which there are no known recreational or other Section 4(f) areas. Additionally, this route appears to be both feasible and prudent when compared to the Basin Route since it would involve about 9 miles less new highway construction, has no significant impact on any major fishing streams, requires much less cut and fill, has minimal effect on the natural beauty of the countryside and mining activities, and costs an estimated $13.5 million less. Moreover, although travel distance between Butte and Boulder is longer via the Whitetail Route, travel time would be about the same as on the Basin Route. This is due to the slower design speeds for the Basin Route which vary repeatedly between 50 and 70 miles per hour because of extensive curves and steep grades.

Another alternative may be State Road 281; but, at this time, we have no information or data to comment on this route as an interstate.

In view of the foregoing, this Department defers to comment on the second facet of Section 4(f); namely, the adequacy of measures to minimize harm to 4(f) lands which may be traversed by other routes.

Draft Environmental Statement

Initially, we wish to compliment the Montana Department of Highways on the quality of this statement and its several appendices. Notwithstanding our further comments, the information and data presented provide a generally good base on which to review and evaluate the environmental impacts.

The final statement should provide information about the assessment of archeological values in the several corridor areas. Archeological counsel may be obtained from Dr. Lee C. Taylor, Department of Anthropology, University of Montana, Missoula, Montana 59801.

In the case of historical resources and in order to assure compliance with the National Historic Preservation Act of 1966 (Section 106), the environmental impact statement should indicate that the National Register of Historic Places has been consulted to determine whether any National Register properties will be affected by the several corridors. The statement should also contain evidence of contact with the Historic Preservation Officer for the State of Montana, the Chief of Recreation and Parks Division, Department of Fish and Game, Mitchell Building, Helena, Montana 59601, for information concerning the effect of the action upon any historical resources which may be in the process of nomination to the National Register of Historic Places.

If properties listed on or proposed for nomination to the National Register will be affected, the statement should contain evidence that the procedures of the Advisory Council on Historic Preservation as they appear in the *Federal Register*, March 15, 1972, have been followed.

We believe the mineral assessment, attachment 3 in Appendix A, adequately describes project impacts on the mineral resources and operations. We would note, however, that this report states that the lower alignment of the highway will have far more harmful effects on present and future mining operations than the upper alignment. From a study of a geologic map and section of the Basin Quadrangle (USGS Bulletin 1151) and aerial photographs of the highway alignment, as included in the statement, we found that the Basin Route is the lower alignment. Thus, accessibility to the Lotta mine tunnel and the Hope shaft from the tunnel will be destroyed.

The Hope workings were accessible from the Katie shaft. Any future exploration of the Hope area probably will be determined by future ownership of the mineral rights. Measures to minimize impacts on mineral accessibility should be included in the statement.

With respect to the Basin Route, we find that it would go through the quartz stockpile area used by the Basin Quartz Quarry. While this is operated by Pacific Silica Company for Union Carbide, we understand that operations will terminate in 2 to 3 years. If highway construction is at least that far away, the stockpile problem should not exist.

The proposed highway lies in a region subject to major earthquakes. The environmental statement should include a discussion of the damage that might occur to highway structures in the event of a major earthquake and the potential of earthquake-triggered landslides occuring, particularly along those parts of the highway near steep slopes.

When the Bureau of Land Management (BLM), of this Department, commented on a preliminary draft statement, mention was made about evaluating State Route 281 as an additional alternative. BLM suggested that "This route might well be cheaper and have less environmental impact than the others and serve the national transportation needs as well as the others." We continue to believe that this is an available alternative which has been overlooked and which warrants evaluation under the Council on Environmental Quality's (CEQ) Guidelines.

The draft statement should more adequately discuss the impacts on publicly owned "de facto" recreation areas in the several corridors. For example, there are several such areas along the Boulder River and Bison Creek where significant public fishing and recreation use occur. Most existing opportunities for dispersed natural-environment public recreation activities will be effectively lost if the Basin Route is selected, and these adverse impacts need clarification in the final combined statement.

We cannot agree with the statement on page 21 that two proposed rest areas (on the Basin Route) will benefit travelers and those using the campgrounds because added toilet and dumping facilities will be provided (underlining added). Travelers no doubt would benefit. However, existing clientele at Elk Park and Shamrock Campgrounds would find the character of the areas significantly altered by the Basin Route. Increased noise and crowding of the campground areas are but two anticipated changes. A radical change in user characteristics may be expected with existing clientele searching for new areas. These impacts warrant identification and discussion in the final statement.

In connection with the Basin Route, we believe that further special design efforts to minimize environmental impacts should be considered if this alignment is pursued. For example, there will be the need for extensive channel relocation (almost 8 miles) and cuts and fills. Three possibilities exist to reduce the right-of-way width and these impacts on the streams and aesthetic values:

1) Use of gabion type retaining walls;
2) Reducing or eliminating the 38-foot median in critical areas by use of the New Jersey type vertical divider; and
3) Greater use of bridges.

Near mile 146.5, bridging Bison Creek and Canyon would eliminate most adverse impacts which fill would create. Public fishing in this creek as well as the Boulder River is significant and deserves special attention, including replacement of any lost access. The final statement should reflect the results of coordination with Montana's Fish and Game Department in planning measures to minimize harm for whichever corridor may be selected.

We would point out that our Section 4(f) comments are preliminary. The final comments and position of the Department of the Interior on the Section 4(f) aspects, if any, will be made to the Department of Transportation when we are requested to review the final statement.

Sincerely yours,

Deputy Assistant Secretary of the Interior

Mr. H. J. Anderson
Director of Highways
Montana Highway Commission
Helena, Montana 59601

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Federal Building, Missoula, Montana 59801

AUG 21 1972

REPLY TO: 1940 Environmental Statements

SUBJECT: Draft Environmental Statement, Interstate 15
Butte to Boulder

TO: Montana Department of Highways
6th Avenue & Roberts
Helena, Montana 59601

We have reviewed the Draft Environmental Statement for Interstate 15, Butte to Boulder. Our comments follow.

After weighing the complex variables associated with this project, we support your plan to follow the Butte-Basin-Boulder route. Our decision is based on the following points.

1. Overall long term environmental impacts will be less.

a. The Basin route is a long established, well used corridor servicing a U.S. highway, railroad, and transmission lines. Traffic statistics indicate that 500,000 to 1,000,000 people used the route in 1970.

b. Fisheries, wildlife, and other esthetic values have already been impacted to a much greater degree on this location than on the other alternatives. This route will continue to exist and be used by through traffic even if another route is used by the interstate. We believe it is advantageous to confine major routes to as few locations as possible.

c. The Basin Route is about 13 miles shorter than the Whitetail route. A lot of traffic from Butte and the west would continue to use the Basin route. This will lead to eventual reconstruction. If Whitetail is selected this will put the impact of interstate construction in one place and reconstruction in another.

2. The Basin route may be the safest.

a. Many travelers will continue to use existing Highway 91, Butte to Boulder even if the interstate is built on the Homestake route.

b. North-south traffic through Butte would have to use Homestake Pass, which is considered hazardous.

3. It is probable that the Basin route best meets the intent of the Highway Act in serving people.

Should the route through Basin be selected, maximum effort should be used to utilize the abandoned railroad grade between Butte and Basin. This plus the use of structures as used in European highway construction and suggested by Fletcher Newby on the Environmental Quality Council should minimize impacts between Elk Park and Basin. We have worked closely with the Montana Highway Department in minimizing impacts on established public facilities covered under Section 4(f) of the Highway Act. We have agreed to eliminate Bison camp and use the replacement monies at Shamrock and Elk Park with rest area facilities at the entrances of the campgrounds. This would restrict camper use to interstate highway users.

This commitment is confirmed in a memorandum dated April 2, 1970, (copy attached) from past Regional Forester Neal Rahm to the Highway Department. This past involvement led to the proposals dealt with in some detail in the Draft Environmental Statement.

Unless final design decisions have been made which would prove impractical to change, we would like to explore in greater detail, alternative No. 2 of page 8, Appendix B for Draft Environmental 4(f) statement. This alternative is to "Eliminate all three campgrounds and provide replacements in other locations." We can live with the earlier decision and commitments, but feel it is possible that other alternatives would better serve the intent of National Forest campgrounds.

As pointed out in the report, fairly heavy use of the existing campgrounds is by area persons. It is likely that the decision to combine the campgrounds with interstate rest stops would effectively restrict or eliminate use except by interstate travelers. If suitable and acceptable locations for replacement under classification 4(f) can be found within 5 miles of the proposed interstate, it is probable that service to area residents, as well as interstate travelers, can be accomplished. Perhaps better locations of the rest stops, such as the Highway Department land at Bear Gulch, would be possible.

In the discussion of this alternative in Appendix B of the Draft Statement, we gather the Highway Department still sees this as a viable alternative. We wish to investigate it in greater detail before a final decision is made to develop rest stops at the two existing campgrounds.

We feel the Highway Department is to be complimented on the attempts they have made to evaluate impacts and their projections to minimize impacts. Every practical means should be utilized to balance and minimize total social, economic, and environmental impacts, regardless of which route is finally selected.

We are confident other agencies will make specific comments regarding their areas of prime responsibility. Therefore, we have not made detailed comments regarding resource impacts in areas such as fish and wildlife, air and water pollution, etc.

Under Item II, INTRODUCTION, OTHER ENVIRONMENTAL FEATURES, page 11, there is a correction needed. The Forest Service has no plans at this time to develop a road between Galena Gulch and Bear Gulch. Past discussions have considered a possible road. However, since that time we have identified this area as a "roadless area" and all previous plans have been cancelled pending future Multiple Use Area Planning for the area.

For Lawrence M. Whitfield
STEVE YURICH
Regional Forester

Enclosure

Date Recd. Preconst. 8-25-72
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3? Hydraulic
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3? [illegible]
✓ Consultant Design
✓ File

United States Department of the Interior

GEOLOGICAL SURVEY
Water Resources Division
P.O. Box 1696
Helena, Montana
59601

MONTANA HIGHWAY COMMISSION
RECEIVED
AUG 8 1972
HELENA, MONTANA

August 7, 1972

Mr. H. J. Anderson
Director of Highways
Montana Department of Highways
Helena, Montana 59601

Your ref 115-2(23)
115-3(10)(11)(12)(13)
Butte-Boulder
Draft Environmental/Section 4(f)
statement

Dear Mr. Anderson:

The following comments with respect to the Butte-Boulder draft environmental/section 4(f) statement were received from the Engineering Geology Branch, USGS, too late for incorporation with our comments of June 23, 1972.

-- The project includes the construction of about 30 miles of four-lane Interstate highway on a new location chiefly in low rolling to hilly terrain largely in stream valleys in mountainous terrain. Deposits of sand, gravel and surface debris overlie granite. Some large cuts and fills and about 6.5 miles of stream channel changes will be necessary.

The proposed highway lies in a region subject to major earthquakes. The draft environmental statement should include a discussion of the damage that might occur to highway structures in the event of a major earthquake and the potential of earthquake triggered landslides occurring, particularly along those parts of the highway near steep slopes.

Sincerely,

George M. Pike
District Chief

cc: Regional Hydrologist, CR
Office of Asst. Chief Hydrologist for R&TC, Code 4300 0016
Attn: G. Davis or G. Chase

ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
SUITE 900, 1860 LINCOLN STREET
DENVER, COLORADO 80203

NTANA HIGHWAY COMMISSION
RECEIVED
JUL 25 1972
HELENA, MONTANA

July 21, 1972

AWIE

Mr. Grover O. Powers, P.E.
Supervisor, Preconstruction Section
Montana Highway Commission
Helena, Montana 59601

Dear Mr. Powers:

The Environmental Protection Agency has reviewed the draft environmental statement for Project I-15, Butte to Boulder, Montana and offers the following comments for your consideration.

1. The description of the environment should include a detailed description of soils along the proposed route, their susceptibility to erosion which could result in water pollution, and the degree to which they can be revegetated after construction. This description should also be included for alternate routes.

2. The appendix prepared by the Montana Fish and Game Department states that 1971 water quality data for the Basin route indicates that mine drainage inhibits fish food production, reduces spawning processes, etc. This water quality data should be included in the environmental statement in order for a reviewer to make an independent evaluation of the effects on aquatic life. Available water quality data, if any, should also be included for alternate routes.

3. The statement indicates that the Burlington-Northern Railroad plans to abandon its tracks between Butte and Basin. The possibility of utilizing the railroad right-of-way, or a portion of same, should be examined to determine if it can be used to avoid or minimize the adverse environmental impacts of the Basin route.

4. Operation and maintenance problems associated with the stated severe winter icing on U.S. 91 in the project area should be discussed, as should potential icing problems on the alternate routes. Water quality problems associated with any current use of de-icing chemicals should be specifically addressed for the present situation, and also for possible future water quality problems associated with the proposed route and alternates.

11. We assume that the 1961 preliminary economic analysis which compared the Whitetail route to the Nez Perce route and existing U.S. 91 through Basin would reach the same conclusions if updated to the present, i.e. the Whitetail route is undesirable based on a road user benefit-cost ratio. However, we disagree with the conclusion that this alternative should not be further considered because of the negative road user benefit-cost ratio, as this should be only one of the considerations in the analysis. Since I-90 (Butte East) is completed, additional capital costs of $18 million would be incurred on the Whitetail route as compared to $29 million and $32 million on the Nez Perce and Basin routes, respectively. Thus, construction of the proposed Basin route instead of the Whitetail route would cost the American public an additional $14 million dollars in construction costs. Based on 10 percent State cost sharing, the Basin route would cost the people of Montana $3.2 million as compared to $1.8 million for the Whitetail route. Therefore, the people of Montana would save $1.4 million in capital costs if the Whitetail route were constructed.

    We recommend that a new economic analysis be made and that for each alternate the annual capital cost, the annual road user cost, and the annual operation and maintenance cost be included. Also, the annual cost for the Whitetail route should include annual maintenance costs for U.S. 91 since it would continue to be maintained, but would not necessarily require extensive upgrading since a significant portion of its traffic would be diverted to the Interstate.

12. The transcript of the public hearing held in 1965 indicates that consideration was being given to constructing a two-lane facility for a portion of the route. The final statement should discuss constraints, legal or otherwise, that prohibit present consideration of a two-lane facility for a portion of the proposed route and its alternatives.

13. SUMMARY. The statement does not present sufficient information to enable a comprehensive environmental evaluation of the proposed route and its alternatives. The points discussed in our comments should be addressed in detail in the final statement. The draft environmental statement acknowledges that the environmental effects of constructing the Whitetail route would be less pronounced than on either the Nez Perce route or the Basin route. The capital costs favor the Whitetail route and a complete cost analysis may show that it is best from an economic standpoint.

5. In view of the narrow canyons through which the proposed highway would pass, and the cuts, fills and channel changes which would be required, consideration should be given to reducing highway design speeds to a degree that would allow highway construction more compatible with the existing environment.

6. Profiles of the highway along the proposed route and alternate routes showing the extent of cuts and fills should be included in the statement. Areas where erosion may be a potential problem affecting water quality should be indicated. In addition, proposed highway cross-sections should be provided for typical areas of cuts and fills, and in areas where extensive stream channelization is proposed.

7. There is no reference to the need for, or source of, fill material for the proposed route or either of the alternates. If there is a net requirement for borrow to meet fill requirements, an estimate of the quantities required, the source, and impacts on the environment of extracting such material should be included in the statement. The possibility of using "clean" solid waste such as demolition debris to meet borrow requirements should be considered. If excavated materials will exceed fill requirements, or are otherwise unsuited for fill material, the final disposition of these materials should be discussed in the statement.

8. The quantities of materials generated by clearing and grubbing activities should be estimated. Included should be amounts of materials to be disposed of both on-site and off-site and the methods of disposal to be utilized,

9. A surveillance program should be developed to monitor stream turbidity levels and other construction induced water quality changes prior to, during, and after construction. This would provide valuable information on the effects of highway construction on water quality during the construction period, and after construction would aid in determining the effectiveness of soil and bank stabilization measures which it is assumed will be an integral part of the project.

10. The statement indicates that the stream channel along the proposed route will be significantly altered in various reaches and in some instances will be returned to its original alignment. The alterations could have a significant influence on stream hydraulics. The statement should consider possible increases or decreases in stream velocities, seasonal variations and the potential, if any for stream bed scouring; potential for increased flood hazard; and the effects, besides habitat alteration, of the proposed channel changes on the existing aquatic ecosystems.

We will be pleased to discuss these comments with you at your convenience. Please send us a copy of the final environmental statement.

Sincerely yours,

John A. Green
Regional Administrator

Date Recd. Precons. 7-26-72
Act Info MAIL ROUTE Attach Initial
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STATE OF MONTANA

DEPARTMENT OF
FISH AND GAME

MONTANA HIGHWAY COMMISSION
RECEIVED
JUN 30 1972
HELENA, MONTANA

Helena, Montana
June 29, 1972

Mr. H. J. Anderson
Director of Highways
Department of Highways
Helena, Montana 59601

Atten: G.O. Powers

Dear Mr. Anderson:

We have reviewed the Draft Environmental Section 4(f) Statement for Project I-15-2(23) and I-15-3(10), (11), (12), and (13), Butte to Boulder, and have the following comments:

In general, there are several areas which will have a profound effect on environmental values in the proposed route locations which were not adequately discussed. There is, in fact, very little discussion of environmental effects, per se, of the project, or of measures to satisfy the Section 4(f) (Transportation Act of 1966) requirement in the report.

Some of the areas that we consider important from an environmental standpoint for which information or discussion is lacking are as follows:

(1) Concerning the stream channel manipulations, it is not apparent in the statement how much channel will be lost due to channel changes. It is also not clear how much channel will be manipulated in one fashion or the other.

(2) Pollution of the stream during channel manipulations will be severe unless unusual methods are used to control this pollution. This is of paramount environmental concern, but the subject is treated very lightly in the report.

(3) There is little discussion of the environmental effects on fish habitat, water quality or the physical effect on the stream by confining stock movement of almost 10,000 head annually to a relatively narrow lane through the canyon area.

(4) Concerning frontage roads, access roads, and interchanges, a discussion of the effects these facilities will have on the canyon environment should be included.

(5) Concerning channel manipulations, there is no discussion of what these manipulations will do to stream hydraulics or the effect of changing the stream hydraulic system will have on bank erosion which will occur when stream distance is modified.

(6) The section on irreversible and irretrievable commitment of environmental resources does not adequately discuss these commitments.

(7) Mitigative measures for the loss of the Bison Creek Campgrounds should be described in more detail as required in Section 4(f). Concerning 4(f) requirements in general, several areas along the Basin route are now being used for recreation by the public. These areas do not have official designation as recreation areas but in our opinion are covered by Section 4(f) because of present use. We also find no discussion concerning fishing streams or game ranges as required by FHWA memorandum 08-24DB, March 30, 1972.

It was our understanding that information supplied for the preliminary draft statement by our Department, at your request, would be incorporated into the report. This information is attached as Appendix C but was largely disregarded in the preparation of the Statement. Also, several specific questions and comments were included when submitting the material in Appendix C but several of these points were largely disregarded. We are therefore resubmitting these questions and comments as a part of the official review of the Statement.

Sincerely,

Don L. Brown

DON L. BROWN
STATE FISH AND GAME DIRECTOR

DLB:ajs

cc: Harold Stewart
Lloyd Meyer
Fletch Newby
LeRoy Ellig

Date Recd. [illegible] 6-30-72
Attach
Initial

Page numbers refer to preliminary draft.

QUESTIONS AND COMMENTS CONCERNING PRELIMINARY DRAFT IMPACT STATEMENT, BUTTE-BOULDE

1. Page 3, line 4, concerning frontage and access roads: Has all of the access to mining claims, health mines, logging areas, etc., been provided? Will any of these require more frontage-type access than is now planned?

2. Page 6, line 5, concerning Forest Service road between Galena and Bear Gulch: What significance does this have concerning interstate?

3. Page 8, 6th line from bottom, concerning independent alignment: Would it be wiser to keep split alignments to a minimum to reduce the amount of land needed for construction? What is the purpose of the split at mile 149 which introduces a curve into the highway?

4. Page 9, line 16, concerning alignment at mile 158: A crossing of the Boulder River is indicated on the route location photo, but no bridge or channel change is indicated.

5. Page 10, line 2: What does the "total 20 miles of the project" refer to?

6. Page 10, line 4, concerning frontage and access roads: We would like detail on these included in the draft statement.

7. Page 10, line 13, concerning culvert crossing of the Boulder River: The river should be bridged at this point to insure fish passage into this unaltered reach of the Boulder.

8. Page 14, concerning table on channel changes: We agree with Grover Powers' note that this table should be revised and clarified. How were determinations on length of altered or unaltered sections of stream made?

9. Page 15, line 5, concerning cuts and channel change: Due to lack of area for mitigation, it may be necessary to reduce channel change by increasing cut areas.

10. Page 15, line 11, concerning public sentiment for Basin Route: It should also be noted that the public did not have the opportunity to consider the Whitetail Pass Route in 1965.

11. Page 15, last sentence on page, concerning access to Bison Creek: Access is needed at more than each end of an approximate 8 mile stretch of Bison Creek.

12. Page 17, line 11 and comments on alternates: Same comment as No. 8.

13. Page 18, line 10, concerning Bison Creek in a culvert: How many feet would the stream be carried under the roadway in a large culvert? This is a deep, steep canyon area. Bridges may be necessary.

14. Page 18, 5th line from bottom: It appears, in the field, that either the Bison campground and/or Bison Creek will be affected at approximate mile 147.3. This should be elaborated on in the draft statement.

15. Page 22, line 7, concerning Boulder River between lanes: This concept should be avoided when at all possible. The stream is generally lost to all future use when lanes are built on both sides.

16. Page 22-23, concerning "detrimental and environmental effects" (?) We see no justification for this statement.

17. Page 23, line 11, concerning water pollution from construction activities: We believe pollution from construction will be severe. A discussion of how both air and water pollution standards will be met should be included. These items are of primary environmental concern, and should have thorough discussion.

18. Page 24, first paragraph, concerning damage to aquatic life: Damage to aquatic life will be severe. The statement by Grover Powers that "No doubt some sections will never recover from the changes involved" is, in our opinion, a concise and true evaluation of the impact.

19. Page 25, concerning air and water pollution: Same comment as No. 15.

20. Page 30, second paragraph, concerning economic analysis of alternate routes: If a discussion of economics of the routes is to be included in the statement, a more recent and more detailed analysis than the "very preliminary analysis from 1961" should be made.

21. Page 32, concerning long-term effects: A discussion of the loss of whatever the canyon now provides for the tourist-related industry which exists now, and the loss of the potential for development to aid this industry should be included in this section.

22. Page 35, concerning steps taken to minimize harm: This section should be expanded and much more specific.

23. There should be a discussion of benefits to be gained in terms of less adverse environmental effects on each route, if any one of the other routes were used for interstate location. More discussion is needed on the Nez Perce and the Whitetail Pass Routes, even if in general terms or estimations, of the amount of adverse environmental effects, e.g., stream channel change, etc.

24. What does the approximate 2 miles of access road beginning at Elk Park and traversing across the hills and ending at Homesite Creek serve?

25. The value of the access road from the Bernice interchange to Bear Gulch is questionable. The proposed route follows through a well vegetated section of Bison Creek, is in an area where active erosion is now occurring, requires several feet of channel change, and crossings of Bison Creek. As we understand it, the discussion for the possible construction of a camp area in Bear Gulch assumed access would be provided across the hills and not on the streambottom. A route across the hills, and the campground itself, will have to be weighed for potential gain.

26. Further information should be supplied for the stock trail. In the vicinities of mile 158 and 154 the space needed for construction appears very limited. At approximate mile 153.6 the trail traverses high across a steep slide rock area.

27. What are the possibilities of moving the Whitetail Pass Route in the valley area further to the western edge of the valley and connecting to the existing Pipestone interchange?

28. What would be the cost of an approximate one mile tunnel under the crest of Whitetail Pass?

29. No mention is made of crossings of tributary streams to the Boulder or streams on alternate routes. Types of crossings may be important from a fish passage standpoint and some discussion should be included.

30. No mention is made of facilities for temporary vehicle traffic or detours while construction takes place. If, for example, a detour across Whitetail Pass were built to specifications similar to the Camel's Hump detour on the St. Regis project, we would expect some additional adverse environmental impact. Proposals for detours should be included in the statement.

MONTANA HIGHWAY COMMISSION
RECEIVED
JUL [illegible] 1972
HELENA, MONTANA

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
REGION VIII
FEDERAL OFFICE BUILDING
19TH AND STOUT STREETS
DENVER, COLORADO 80202

July 19, 1972

OFFICE OF THE REGIONAL DIRECTOR

Re: Draft Environmental Impact Statement
Project I 15-2(23); I 15-3 (10), (11), (12),(13)
Butte to Boulder

Mr. H. J. Anderson, Director of Highways
Attn: Mr. Grover O. Powers, P.E.
Supervisor-Preconstruction Section
Montana Department of Highways
Helena, Montana 59601

Dear Mr. Anderson:

We have reviewed the referenced statement as submitted to Region VIII. The effects on the social well being of those people affected appears to have been quite well covered. It is anticipated that measures will be incorporated to relieve the adverse effects.

Thank you for submitting the statement for our review.

Sincerely yours,

Elwyn Holtrop

Elwyn Holtrop, P.E.
General Engineer
Environmental and Inspection
ROFEC

ACT INF
RETURN TO M & F
MAY BE RETAINED
DIRECTOR
CENTRALIZED SERVICES
ACCOUNTING
DATA PROCESSING
PLANNING & RESEARCH
ENGINEERING
PRECON. BUREAU
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CONSTRUCTION
MATERIALS
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Date Recd. Preconst. 7-21-72

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United States Department of the Interior
NATIONAL PARK SERVICE
MIDWEST REGION
1709 JACKSON STREET
OMAHA, NEBRASKA 68102

JUL 17 1972

IN REPLY REFER TO:
D30 MWR CF
Your 30-GOP

Grover E. Powers, P.E.
Supervisor-Preconstruction Section
Montana Highway Commission
Helena, Montana 59601

Dear Mr. Powers:

Replying to your May 31 letter requesting review of the Draft Environmental/Section 4(f) Statement for the Montana Butte-Boulder project, I 15-2(23), I 15-3(10)(11)(12)(13), we offer the following information:

In accordance with Part 516 National Environmental Policy Act of 1969, Department of the Interior Departmental Manual Chapter 3, 516.3 7A, our comments on this statement were forwarded to the Regional Director, Bureau of Outdoor Recreation, Mid-Continent Region, Denver, Colorado. We believe our comments will be reflected in a response from this agency.

Sincerely yours,

Bill W. Dean

Bill W. Dean
Acting Director
Midwest Region

Date Recd. Precenst. 7-21-72

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National Parks Centennial 1872-1972

HIGHWAY COMMISSION
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JUL 17 1972
HELENA, MONTANA

DEPARTMENT OF THE ARMY
OMAHA DISTRICT, CORPS OF ENGINEERS
7410 U.S. POST OFFICE AND COURT HOUSE
OMAHA, NEBRASKA 68102

MROED-PE

10 July 1972

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Mr. H. J. Anderson
Director of Highways
State of Montana
Department of Highways
Helena, Montana 59601

Dear Mr. Anderson:

I refer to the Draft Environmental/Section 4(f) Statement for the Interstate 15 Butte to Boulder project.

The proposed project would not have any effect on existing Corps of Engineers projects or upon Omaha District proposals presently under consideration. In general, the draft statement adequately discusses the environmental impacts of interstate highway construction in Montana. However, the following comments are offered:

a. Page 22. Detrimental Effects. This section should include data pertaining to the number of acres of trees to be cleared.

b. A discussion of the method of disposal for the cleared trees and brush would enable the reviewer to more properly evaluate the impacts of construction.

We appreciate the opportunity to review the subject draft environmental statement.

Sincerely yours,

R. G. BURNETT, P.E.
Chief, Engineering Division

Date Recd. Precorst 7-18-72

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[illegible]				
[illegible] Consultant Design				
File				

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
1930-9th Ave. South, Great Falls, Mt. 59405

MONTANA HIGHWAY COMMISSION
RECEIVED
JUL 1972
HELENA, MONTANA

July 10, 1972

Grover P. Powers, P.E.
Supervisor-Preconstruction Section
State of Montana
Department of Highways
Helena, Mt. 59601

Dear Mr. Powers:

In reference to: I 15-2(23)
I 15-3(10) (11) (12) (13)
Butte-Boulder
Draft Environmental/
Section 4(f) Statement

This office has no comments. Other SCS offices with more direct contact and knowledge of this project are making comments.

Sincerely,

Wendell Thacker
Wendell Thacker
Area Conservationist

Date Recd. Precons. 7-11-72
Act | Info | MAIL ROUTE | Attach | Initial
RIGHT OF WAY
PLANNING & RESEARCH

UNITED STATES POST OFFICE

IN REPLY REFER TO
AHW:em

BUTTE, MT 59701
June 29, 1972

Mr. Grover O. Powers, P. E.,
Supervisor-Preconstruction Section
State of Montana
Department of Highways
Helena, MT 59601

Dear Mr. Powers:

With reference to your memorandum of May 31, 1972, I have reviewed the draft environmental statement concerning highway improvement between Butte and Boulder, Montana and have found nothing which convinces me that the Butte, Basin, Boulder route should be abandoned in favor of either of the other proposals.

Speaking as a citizen, this appears to be the least expensive and most accessible route, having a portion of the work completed near Butte and certain lands available from the railroads at nominal or no cost.

Speaking as the Postmaster in Butte, Montana, I find that the other routes would make delivery of mail much more difficult; would eliminate services to small communities and would be considerably more expensive from an operational standpoint.

I would strongly urge adoption of the Butte, Boulder, Basin Route.

Very truly yours,

AHWilkinson

A. H. Wilkinson
Postmaster
Butte, MT 59701

6-30-72
Pub Hearing
File

State of Montana

State Department of Health
and Environmental Sciences
HELENA, MONTANA 59601

[illegible]
Director

June 26, 1972

Mr. H. J. Anderson
Director of Highways
Department of Highways
Helena, Montana 59601

Re: I 15-2(23)
I 15-3(10) (11) (12) (13)
Butte-Boulder Draft
Environmental/Section 4 (f)
Statement.

Dear Mr. Anderson:

The environmental impact statement for the above referenced project has been reviewed by our office.

This is a very difficult project from the standpoint of maintaining the State's water quality standards. It is recognized that control measures can prevent serious degradation and the needed control measures must be provided to minimize the effect upon the streams. This will take good design and construction techniques and adequate inspection by your personnel. Assuming that these measures will be carried forth, we have no objection to the project as proposed.

Sincerely yours,

D. G. Willems

D. G. Willems, P.E., Chief
Water Quality Bureau
Environmental Sciences Division

DGW:sh

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL BUILDING, 19th AND STOUT STREETS
DENVER, COLORADO 80202

REGION VIII

MONTANA HIGHWAY COMMISSION
RECEIVED
JUN 22 1972
HELENA, MONTANA

June 19, 1972

IN REPLY REFER TO:
8M

Mr. Grover O. Powers, P.E.
Supe[illegible]or - Preconstruction Section
Dep[illegible]nt of Highways, State of Montana
Helena, Montana 59601

Dear Mr. Powers:

Subject: Comments on Draft Environmental Statement
Butte to Boulder
Project No. 1 15-2(23);1 15-(10), (11), (12), (13)

We have reviewed the subject draft Environmental Statement transmitted to us by your May 31, 1972 letter.

The Environmental Statement provides sufficient information concerning the impact of the proposed project on the urban environment to enable us to evaluate this aspect of the project. As you know, HUD is primarily concerned with (1) the effect of a proposed action on the urban environment and (2) the consistency of such actions with the comprehensive planning for the area.

Our only comment with regard to the proposed project is that methods of minimizing the adverse environmental effects which are inherent with construction activities; i.e., noise pollution, air pollution, water pollution, etc. be considered.

Sincerely,

John J. Wilder,
Assistant Regional Administrator
Community Planning and Management

RETURN TO M & F
CENTRALIZED SERVICES
ACCOUNTING
DATA PROCESSING
PLANNING & RESEARCH
ENGINEERING
PRECON BUREAU
BRIDGE
CONSTRUCTION
MATERIALS
PRECON SECTION
RIGHT-OF-WAY
GROSS VEHICLE WEIGHT
LEGAL
MAINTENANCE
MOTOR POOL
PERSONNEL
OTHER

Thomas J. Hitchcock
[illegible]
COUNTY SUPERINTENDENT OF SCHOOLS
OF SILVER BOW COUNTY
BUTTE, MONTANA

MONTANA HIGHWAY COM[illegible]
RECEIVED
JUN 16 1972
HELENA, MONTANA

June 15, 1972

RETURN [illegible] & F	MAY BE [illegible]	DIRECTOR	CENTRALIZED SERVICES	ACCOUNTING	DATA PROCESSING	PLANNING & RESEARCH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	PRECON[illegible]	RIGHT-OF-WAY	[illegible]
INF														
ACT														

Mr. Grover O. Powers, P.E.,
Supervisor-Preconstruction Section
Department of Highways
Helena, Montana 59601

Dear Sir:

In compliance with Public Law 91-190, Section 102(2)(C) and Public Law 89-670, Section 4(f), I would highly recommend the Butte-Boulder Interstate. The conditions would be improved economically, environmentally, and socially and eliminate many accidents in the future. I hope.

Very truly,

Thomas J. Hitchcock
County Superintendent of Schools

TJH/lr

Date Recd. Preconst. 6-16-72

Act	Info	MAIL ROUTE	Attach	Initial
		30 GCP | RMH		/
		30 Field Design		
		30 Surfacing Design		
		31 [illegible] Engineers		
		32 West Region		
		32 [illegible]		
		33 East Region		
		34 Hydraulic		
		[illegible]		
		37 [illegible] Hearings		
		[illegible]		
		[illegible] Consultant Design		
	✓	File		

U.S. DEPARTMENT OF COMMERCE
Economic Development Administration
415 First Avenue North
Seattle, Washington 98109

(206) 442-5476

Mail & File

June 8, 1972

Mr. Grover O. Powers, P. E.
Supervisor - Pre-Construction Section
State of Montana
Department of Highways
Helena, Montana 59601

Dear Mr. Powers:

Subject: I 15-2(23)
I 15-3(10)(12)(13)(11)
Butte-Boulder Draft E.I.S.

Thank you for the opportunity to review the Draft E.I.S. Our office has no comments. We are sending the copy to our EDA Rocky Mountain Regional Office who now have jurisdiction over your State.

We appreciate your coordination but would request that we be taken off your mailing list and substitute Rocky Mountain Regional Office. Their address is as follows:

Regional Director
Rocky Mountain Regional Office
Suite 505 - Title Building
909 - 17th Street
Denver, Colorado 80202

Sincerely,

Ross B. Manley, Chief
Technical Support Division

cc:
EDA - Denver

Date Recd. Precons. 6-12-72

Act	Info	MAIL ROUTE	Attach	Initial
		30 [illegible]		
		30 Field Design		
		30 Surfacing Design		
		31 Office Engineers		
		32 West Region		
		32 Landscape		
		33 East Region		
		34 Hydraulic		
		35 Traffic		
		Pub. Hearing		
		Sec. Roads		
✓		Consultant Design		
	✓	File		

STATEMENT SUBMITTED TO MONTANA DEPARTMENT OF HIGHWAYS
Boulder, Montana June 29, 1972

Location Hearing-Butte-Boulder-I-15
Location and Design Hearing-Basin-Boulder-I-15

BY: MONTANA LEAGUE OF CONSERVATION VOTERS
Box 80
Missoula, Montana 59801
William Tomlinson & Mavis Mckelvey Co-Chairman

The Montana League of Conservation Voters finds the Butte to Boulder I-15 Project Impact Statement deficient, complying with neither the letter or the spirit of the National Environmental Policy Act hereafter refered to as NEPA, or the Montana Environmental Policy Act hereafter refered to as MEPA.

NEPA states in pertinent part that:

> Title I, Section 102(2)(C)(iii)
> The congress authorizes and directs that to the fullest extent possible...all agencies of the federal government shall...include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on...alternatives to the proposed action.

MEPA states in pertinent part that:

> RCM 69-6504(b)(3)(iii)
> The legislative assembly authorizes and directs that, to the fullest extent possible...all agencies of the state shall...include in every recommendation or report on proposals for projects, programs, legislation and other major actions of state government significantly affecting the quality of the human environment, a detailed statement on... alternatives to the proposed action.

The MLCV finds little attempt being made in this statement under discussion tonight to critically or seriously evaluate alternatives either of a design or location nature. There is no discussion of the feasibility of constructing a two lane facility rather than the four lane which is proposed. We recognize that this alternative would require special congressional authorization, however it seems to offer a reasonable alternative, resulting certainly in a reduction of both construction costs and environmental damage. The traffic counts and projections made would seem to support serious consideration of this alternative.

All alternatives have not been studied equally. The Impact

Statement appears to be a project serving document. Alternative cooridors between the terminuses may exist in addition to the 1 evaluated in detail and the 2 briefly examined. Alignment and design alternatives definitely have not been explored to the full degree necessary for compliance with the afore stated sections of the NEPA and the MEPA.

On June 16, 1972 the Montana Environmental Quality Council viewed a slide presentation describing the Italian "Autostradas". Other Europeans, the Swiss, Austrains, Germans and French are building comparable highways. These highways perched on pillars almost entirely eliminate the cut and fill currently practiced which is so damaging to the site through which the highway moves. Wildlife are free to move at will under the highway. The rivers and streams are left intact. It appears from the above cited experiences that these highways can be built economically.

In the case of Natural Resources Defense Council v. Morton a comparable situation was encountered. In the opinion and order of the U.S. District Court, District of Columbia, Judge Charles R. Richey ruled that:

> "The court finds that the *defendants failed to comply with NEPA by failing to discuss some alternatives at all, such as* meeting energy demands by *federal legislation or administrative action*...In addition the defendants only superficially discussed the alternatives listed in their final Impact Statement, and they failed to discuss in detail the environmental impacts of the alternatives they listed in the statement. The Court does not wish to give the impression that it believes the alternatives are better than the proposed lease sale, but it believes that these alternatives must be explored and discussed thoroughly in order to comport with the intent and requirements of Section 4332(2)(C) of NEPA" (Emphasis added)

Upon appeal to the U.S. Court of Appeals, it was further ruled that:

> "The mere fact that an alternative requires legislative implementation does not automatically establish it as beyond the domain of what is required for discussion, particularly since NEPA was intended to provide a basis for consideration and choice by the decision makers in the legislative as well as the executive branch."

The MLCV thus urges the Montana Highway Department to seriously reconsider the project here under discussion, and to examine such alternatives as:(1)a two lane interstate, recognizing the need for congressional approval;(2)the employment of an "Autostratus"type construction;(3)other corridor alternatives.

STATE OF MONTANA

RECEIVED
JUL 13 1972
HELENA, MONTANA

Date Recd. Precnst. 7-13-72

Act	Info	MAIL ROUTE	Attach	Initial
		30 G[illegible] RMH		
		30 Field Design		
		30 Surfacing Design		
		31 [illegible]		
		32 [illegible] Region		
		32 Landscape		
		33 East Region		
		34 Hydraulic		
		35 [illegible]		
		37 [illegible]		
		[illegible]		
		Co[illegible] Design		

July 12, 1972

Mr. H. J. Anderson
Director
Department of Highways
Helena, Montana

Attention: Mr. Grover O. Powers, P.E.,
Supervisor - Preconstruction Section

Dear Mr. Anderson:

This will acknowledge receipt of the draft environmental impact statement on the Butte to Boulder project.

I believe the concerns of the Environmental Quality Council have been adequately documented without further comment on the statement.

The Environmental Quality Council is deeply concerned that all alternatives be explored and that the Section 4(f) considerations receive adequate treatment.

Thank you for complying with the Montana Environmental Policy Act.

Sincerely yours,

FLETCHER E. NEWBY
Executive Director

FEN/mb

STATEMENT SUBMITTED TO MONTANA DEPARTMENT OF HIGHWAYS
BUTTE, MONTANA, JUNE 28, 1972
LOCATION HEARING-BUTTE-BOULDER-I-15
LOCATION AND DESIGN HEARING-BASIN-BOULDER-I-15

By Fletcher E. Newby, Executive Director
State of Montana
Environmental Quality Council

The Environmental Quality Council (EQC) has been asked to act in its statutory capacity under Section 69-6514 of the Montana Environmental Policy Act to review and appraise the activities of the Department of Highways in the proposed Butte-Boulder interstate highway project. Senator Neil Lynch of Butte has asked the EQC to investigate design alternatives which would reduce environmental damages on the Butte-Basin-Boulder alternative route. Representative Dorothy Bradley of Bozeman has asked the EQC to investigate route alternatives.

It is not the purpose of the EQC at this time to present a detailed critique of the environmental impact statement.

In addition to the sections of the National and Montana Environmental Policy Acts that direct agencies to prepare environmental impact statements, there are other sections of great significance. Both Acts state that all agencies shall utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making which may have an impact on man's environment. (NEPA-Section 102(2)(A), MEPA-Section 69-6504(b)(1)). We believe there was in fact little involvement of the so-called environmental design arts in this undertaking.

Further, agencies shall identify and develop methods and procedures which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision making along with economic and technical considerations. (NEPA-Section 102(2)(B), MEPA-Section 69-6504(b)(2)). We believe that the resource management agencies affected by the proposed project and which have some input in the statement have not adequately identified the unquantified environmental amenities and values affected by the proposed highway routing. Examples are the numerous de facto recreation areas along the proposed Butte-Basin-Boulder route. These agencies are Bureau of Land Management, U.S. Forest Service, and the Montana Fish & Game Department. It seems clear that the balancing process envisioned by the Acts and clearly stated by the reviewing courts in cases involving similar considerations has not been adequately accomplished.

Both Acts state that agencies shall study and develop and describe appropriate alternatives to recommend courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources. (NEPA-Section 102(2)(D), MEPA-Section 69-6504(b)(4)). This brings us to the nub of the matter for there surely are unresolved conflicts and we are seeking appropriate alternatives. These provisions that I have mentioned are legislative mandates which all state and federal agencies must observe,

It came to our attention through the Rocky Mountain Center on Environment that European highway construction methods frequently result in much lighter impact upon land and water resources. Accordingly through a design consultant firm we contacted the Italian Embassy in Washington, D. C. for highway design information on the world-renowned Italian Autostrada. This information is now in the hands of the Department of Highways.

The EQC in executing its responsibility for determining the extent to which the activities of agencies such as the Department of Highways are contributing to the achievement of the policies and directions to state agencies expressed in the MEPA, adopted the following recommendations, each as a separate motion:

Mrs. Marble MOVED the first recommendation be approved, seconded by Mr. Wicks and ADOPTED as follows: (1) That the Council recommend that the department of highways give further consideration to the possibilities of innovative highway design and construction techniques which might minimize the environmental impact on any of the alternative routes under consideration. The council believes effective use of innovative design techniques to reduce environmental impacts could eliminate some of the potential objections to the selected route.

Senator Dzivi MOVED the second recommendation be approved, as amended, seconded by Mr. Hook and ADOPTED as follows: (2) That the Council recommend that the Department of Highways utilize the services of an interdisciplinary design team including the environmental design arts in any study or restudy of design alternatives on this and future highway projects.

Mrs. Marble MOVED the third recommendation be approved, seconded by Dr. Walter and ADOPTED as follows: (3) That the Council recommend that the resource management agencies possessing appropriate expertise more adequately identify the "unquantified environmental amenities and values" during the review and comment period.

It is the intention of the EQC to continue to explore route and design alternatives with the advice of Rocky Mountain Center on Environment and any other sources of expertise such as the Environmental Protection Agency which has been consulted.

This statement is not to be interpreted as an endorsement or rejection of the project or any of the alternative proposals.

SECTION VII

EVALUATION and ROUTE SELECTION

MORRISON-MAIERLE, INC.
Consulting Engineers Helena, Montana

Page

SECTION VII - EVALUATION AND ROUTE SELECTION

IMPACT EVALUATION SUMMARY ---------------------------------- 505
  Impact Evaluation Summary Chart -------------------- 506
COMPARISON OF DETERMINANTS ---------------------------- 507
  A. Highway Economics ------------------------------ 507
  B. Engineering and the Environment --------------- 508
  C. The Natural Environment ------------------------ 509
    1. Impacts of Interstate on Four Alternate Routes ---------------------------------- 509
    2. Impact of Construction Improvements on Primary and Secondary Highways ----------- 511
  D. Socio Economic Study -------------------------- 512
    1. Transportation Industry Importance --------- 512
    2. Traffic Volumes Affecting Communities ------ 513
    3. Right-of-Way Considerations ---------------- 513
  E. Public Opinion --------------------------------- 514
  F. Highway Safety --------------------------------- 514
    1. Accident Loss Projection ------------------- 514
    2. Alignment Influence ------------------------ 516
    3. Route Continuity -------------------------- 517
  G. Highway Service to Highway Users -------------- 518
    1. Route Length ------------------------------- 518
    2. Road User Route Selection ----------------- 518
    3. Route Length Convenience ------------------ 520
    4. Traffic During Construction --------------- 520
    5. Conservation of Energy -------------------- 521
ROUTE SELECTION -- 522

EVALUATION AND ROUTE SELECTION

An evaluation of various individual aspects of each of the four alternate routings was made by members of the interdisciplinary study team who possessed the expertise in their particular field of study. The preceding sections of this report give the results of these evaluation efforts. This section deals with an evaluation of the composites of all these individual studies. Some aspects of the evaluations are necessarily subjective since it is impossible to quantify and even difficult to qualify many of the intangible features of the impact of Interstate construction on any of the route alternates even though the impacts are identified and amenities are recognized. Nevertheless, it is felt that the interdisciplinary team which cooperated in the preparation of this study has made it possible to recommend a routing for Interstate 15 which will serve the best interests of the public and the majority of those directly concerned with the results.

IMPACT EVALUATION SUMMARY

The impact evaluation tabulation shown on the following page is a summation of the impact ratings of individual studied categories which were evaluated by the study experts for that category. A category rating is included for Socio-Economics although a component rating graph is not included in Section V. The advantage of using a chart presentation and the rating basis was explained previously in the text on page v. The ratings are relative to each other for comparing routes within the same category and do not necessarily reflect a degree of detrimental impact.

INTERSTATE 15
BUTTE TO BOULDER

IMPACT EVALUATION SUMMARY
by
ROUTE

CATEGORY	BASIN	NEZ PERCE	WHITETAIL	BOULDER VALLEY
THE NATURAL ENVIRONMENT	●	●	◍	○
SOCIO-ECONOMIC STUDY	○	○	●	●
ENGINEERING AND THE ENVIRONMENT	◍	●	◍	○
HIGHWAY ECONOMICS	○	◍	◍	●

HIGH IMPACT	●
MEDIUM IMPACT	◍
LOW IMPACT	○

COMPARISON OF DETERMINANTS

The chart cannot be used as the only basis for a decision on the route selection. The relative merits and faults of an alternative must be considered on the whole and then compared to the other alternates. A review of the categories in the chart will be made followed by some important elements and ramifications which are not reflected in the chart.

A. HIGHWAY ECONOMICS.

The term highway economics as used in this report refers to the category of annual costs directly related to the construction of the physical highway facility, the continuing maintenance of it, and the cost to the highway user of vehicle operation on the highway. Maintenance cost is usually the smallest of the three elements of cost. Operating cost totals vary with different routes due to differences in the number of vehicles that travel a given route and its length. Construction costs vary according to the extent of construction work required. These three groups of costs are all paid for by the road user through taxes on motor fuels and accessories and they are additive for each alternate so that a comparison of total costs can be made. The initial construction costs prorated over the years of life expectancy of the facility are usually much smaller on an annual basis than are the annual road user operating costs. In this study, they are under 20% of the operating costs for traffic in the Butte-Boulder-Whitehall area.

The Basin Route would provide the most economic benefit to the highway user of any of the four routes studied. The total of the annual construction, road user operating and maintenance costs for the Basin Route are the lowest of any alternate as shown on Figure 14 in Section II.

Compared to the Basin Route, the additional annual transportation costs on a regional basis are:

	Per Year	20 Year Period 1977-1997
Nez Perce Route	$300,000	$6,000,000
Whitetail Route	566,000	11,320,000
Boulder Valley Route	786,000	15,720,000

The Nez Perce Route has the lowest cost per individual trip for cars as shown on Table 7, Section II. Basin Route has the lowest for trucks and the second lowest for cars. Whitetail and Boulder Valley Routes are respectively third and fourth highest due to their greater route lengths.

B. ENGINEERING AND THE ENVIRONMENT.

The expected impacts to several areas of engineering and environmental features are shown in the Chart on page 168.

1. Geology and Seismic Considerations. The geology of the area was evaluated by its potential effect on construction. The rock sidehills of the Basin, Nez Perce and northern portion of the Whitetail Route are basically granitic which would cause more difficult construction than the sediments in the broad valley bottoms of the Whitetail and Boulder Valley alternates and the Elk Park meadow on the Basin Route. There are fault lines crossing all four alternates, but there has been no movement in recorded history. Seismic considerations were the same for all routes studied.

2. Hydrologic and Channel Studies. This field was evaluated in terms of the amounts of stream channel changes needed, and the consequent changes of the hydraulics in the stream reach. The Basin Route would have the greatest amount of channel changes. The Nez Perce Route would incur a high degree of impact due to changes of the Little Boulder River. Changes on

the Whitetail and Boulder Valley Routes are insignificant. Analysis of channel hydraulics indicates there would be a small amount of change from the natural channel water transportation conditions.

3. Air Quality and Noise Levels. These two areas of pollution were evaluated following Federal Highway Administration guidelines. Since the levels that are predicted are low, only a slight impact is expected on any of the routes. The low values are due to the low traffic volumes encountered in rural Montana.

4. Water Quality. In order to preserve water quality, residues in the form of greases or oils, turbidity, sediment and sludge must be kept from reaching the stream. The greatest source of pollution would be turbidity caused by channel change construction. This impact would be extensive on the Basin Route, due to the large amount of channel changes. It would be severe on the Nez Perce Route due to construction along the Little Boulder River and less space available for precautionary measures. This would result in a short term impact during construction and for a short period following.

5. Climate. Climatic impacts were evaluated according to forecasted maintenance that each route would require as determined by past experience with roads in the area and the road design features incorporated, as controlled by the terrain due to driving under hazardous weather conditions. Under this analysis, the Basin Route was judged to be the best route to the driver under bad conditions.

C. THE NATURAL ENVIRONMENT.

1. Impact of Interstate on the Four Alternate Routes. Possible impacts to the natural environment were considered only for the portions of

potential new Interstate route construction and exclude completed four-lane sections of I-90 and I-15. They can generally be grouped according to changes made to the landscape, and effects on fish and wildlife, recreation and historical remains.

A predominant guide used in determining the relative ratings was the anticipated extent of change. This was applied to physical changes in the terrain such as relocation of streambeds and addition of highway embankment and hillside cuts requiring the removal of cover vegetation for the width of strip required for the highway. These changes, identified as impacts under physiography, geology, vegetation, and aesthetics components in the text, would be most extensive on the Basin and Nez Perce Routes as they have the largest proportion of their length in mountain canyons with irregular hillsides and with each containing a stream paralleling much of the highway alignments. The Boulder Valley Route had the lowest impact ratings and the Whitetail Route shows somewhat less impact than the other two routes. The impact rating on fisheries is low on Whitetail and Boulder Valley Routes due to no streams affected, and high on Basin and Nez Perce due to the stream channel relocation required.

The effect on wildlife by the Boulder Valley Route is low since it is all open ground and there is little migration across it by the antelope, the only prevalent big game species in the valley. The Whitetail Route was rated medium potential impact. Information presented on page 239 stated that the Interstate could possibly result in interference with elk migration and access to summer and winter range in the Whitetail Pass area. It may also divide the antelope range located at the south end of the route and possibly also separate their winter and summer range. The Basin and Nez Perce Routes were given ratings of overall high impact. There are no large migrations of big game across either of these corridors but habitat would be taken for Interstate right-of-way and construction on both, and these routes were evaluated as causing some loss of access for hunting due to the controlled access feature.

Recreation is rated as receiving a low impact on Whitetail and Boulder Valley Routes. It is rated medium and high on Nez Perce and Basin Routes, largely due to encroachment on existing campgrounds, and adverse effects on sport fishing due to stream alterations and reduced random access for fishing.

No route was rated high for potential effects on historical or archaeological relics. Due to possible encroachment on some remains in the Whitetail and Basin Routes, they were rated medium and the other two were rated as low.

2. Impact of Construction Improvements of Primary and Secondary Highways. The comments on the preceding page summarized the potential environmental impacts on the four corridors based on the construction of I-15 along each of the routes respectively. Just as it is necessary to evaluate the influence that traffic volumes on the Interstate on one route may have on the traffic volumes on a remaining road as part of the area transportation network, it is necessary to examine potential environmental impacts on other area roads as a result of Interstate construction on a particular route.

The consequent environmental effects would be most adverse with the Interstate on either the Whitetail or the Boulder Valley Routes. The forecast for over 700 vehicles as the average daily traffic in the year 1987 that would remain on primary route U S. 91 in preference to taking either of these longer I-15 routes, would require upgrading of alignment and road width to State primary highway standards for 50 mile per hour speeds.

Such reconstruction would produce the same kind of impacts on the landscape appearance through roadway cuts and fills and stream channel relocations but to a lesser extent. A narrow-median four-lane Interstate is proposed for the Basin Route in sections of the Boulder and Bison Canyons where terrain imposes restrictions and these are also the areas where the most impact would occur from reconstructing existing U.S. 91. It is estimated that even though a two-lane primary roadway was to be built in these areas instead of a four-lane Interstate, the reduction in environmental impact would only be about 35 to 40 percent. This impact would, of course, be in addition to the impact caused by Interstate construction along the other corridor.

Concerning the other routes, the Basin Route would cause minimum impacts on the other remaining roads. The Nez Perce primitive road would be unaffected and the existing unpaved road over Whitetail would continue with low use. The Boulder Valley existing highway would be upgraded and widened as needed, but with very small landscape change due to the flat terrain. The Nez Perce Route as Interstate would result in similar minor environmental effects on the present status of the Whitetail and Boulder Valley roads but would require some upgrading of U.S. 91 through Basin.

D. SOCIO-ECONOMIC STUDY.

This category covers the broad field of interdependent relationships of people and their contacts in society for commerce, employment, community growth and services, housing and recreation.

1. Transportation Industry Importance. The functioning of the economy of the United States is and will continue to be substantially based in highway transportation. Nationally one of every six jobs is in a highway-

related industry, one of every six businesses are in the motor vehicle field, and intercity freight movements on highways are forecast to double in the next twenty years.

Passenger and freight transportation systems have been and will continue to be important to the economic and social systems of Butte as indicated by present interstate service provided by three railroads, two airlines and two bus lines. Completed east-west I-90 serves Butte and constructed I-15 extends south from Butte. The new Port of Butte with attendant U.S. Custom Services is authorized for import-export of direct international shipments with foreign countries and will rely heavily on surface transportation systems for materials distribution.

2. Traffic Volumes Affecting Communities. The routes that would bring the most traffic into Butte would directly or indirectly provide the most economic benefits to the maximum number of people. Analysis of traffic movements on a regional basis indicates that approximately 400 to 500 fewer vehicles per day, or on an annual basis 146,000 to 182,000 fewer vehicles per year, would enter or leave Butte if either the Whitetail or Boulder Valley Routes are constructed. These figures are for the average traffic in the year 1987.

3. Right-of-Way Considerations. There would be no significant effect on the existing social systems within the four corridors caused by Interstate construction in any of them. Relocation of five families in Basin would be required with the I-15 through Basin and special housing relocation financial assistance is part of the Federal aid highway program. Even though this route would require relocations of the most families, the impact is not considered significant.

The largest taking for Interstate right-of-way would be on the Boulder Valley Route for private land, and the Nez Perce Route for forested land. The Nez Perce Route would take almost no irrigated land and the other three alternates would take about 60 acres each.

The least adverse effect on the trades and services for any of the towns in the study area would be realized with the Basin Route.

E. PUBLIC OPINION.

Public opinion has been expressed for route preferences and the Basin Route has received the greatest backing. There are 39 organizations and individuals who have gone on record by letter or verbal public hearing testimony supporting the route. Four such parties endorsed the Whitetail Route. One public agency has indicated support of either the Whitetail or the Boulder Valley Route. No support was expressed for the Nez Perce Route.

The public interest in the Butte to Boulder routing of I-15 has prompted two petitions to be circulated and submitted to the Montana Department of Highways. One includes over 16,000 signatures favoring the Basin Route. Another, expressing the desires of a large group of north Boulder Valley ranchers, gives support to the Basin Route, but, more so, signified unified opposition to the Boulder Valley Route.

F. HIGHWAY SAFETY.

1. Accident Loss Projection. Analysis of available traffic accident information which is compiled annually and used by both the Montana Department of Highways and the State Highway Traffic Safety Office shows that the forecast number of traffic accidents, fatalities, and economic losses from highway accidents would be lowest on the Basin Route.

In comparison with the Basin Route, each of the other alternates, if built in lieu of the Basin Route, would result in the following tabulated additional amounts.

Estimated Increased Accident Amounts for the Total 20 Year Period 1977 to 1997 for the Three Highest Accident Loss Routes Relative to the Lowest Accident Loss Route - The Basin Route - For the Butte-to-Boulder-to-Cardwell-to Butte Area

	Accidents Number More	Fatalities Number More	Economic Losses Amount More (1971 Costs)
Nez Perce Route	20	0	$ 8,000
Whitetail Route	220	20	1,360,000
Boulder Valley Route	400	40	2,560,000

The number of accidents and fatalities listed are based on vehicle miles that would be traveled according to total traffic assignments for the various alternate routes and the following incident rates.

	MONTANA RATES - 1971	
	Accident Number of Accidents Per Million Vehicle Miles	Fatality Number of Fatalities Per 100 Million Vehicle Miles
Interstate (constructed)	1.6	6.5
Primary Highways	2.7	8.5

Montana rates for 1972 are not yet available. Prior to 1969, rates were not compiled separately for primary and Interstate. Using the average rates for the period available 1969-1971 would yield even somewhat greater differences between the Basin Route and the other three routes. Use of statewide average rates should provide the best projection figures and avoid the possibility of distorted rates that might occur through the use of a few years data on the subject roads which might involve several bad accidents and high rates. These estimates are based on the best available accident statistics for the State and include the effect of all the traffic on all the roads in the small area from Butte to Boulder to Cardwell to Butte. It includes all I-90 traffic assigned with the Basin Route as well as for each of the other routes so that only the differences are shown.

The economic loss amounts are based on the average costs figures of the National Safety Council which they allotted to losses as follows for the year 1971: $3,100 per injury, $52,000 per fatality, and $400 of property damage per accident. Amounts for 1972 are not yet available.

The economic loss differences tabulated are for future average traffic volumes using the road and present day loss valuations. The three units of assigned dollar loss values of the National Safety Council for 1969 to 1971 shows that they increased 8% from 1969 to 1970, and 15% from 1970 to 1971. Due to present economic trends and past accident trends, the economic losses sustained per accident, injury or fatality in 1972 are anticipated to be substantially higher than those estimated.

2. Alignment Influence. Highway geometrics have a marked effect on the safety of a highway. Sharp curves (5 degrees to 7½ degrees of curvature) and steep grades (5%-6%) and the combination of the two make a highway less safe. Referring to Tables 1 and 2, summaries of lengths of horizontal curves an/ profile grades on pages 93 and 94, it can be seen that the Whitetail and Boulder Routes have greater lengths of 6% grades than either the Basin or Nez Perce Routes. Nez Perce Route has the greatest total length of 5% grades and Basin Route the least extent of 5% and 6% grades combined. Although the Basin Route has the greatest length of curves in the 50 mile per hour speed range, they are on sections with relatively flat grades.

Basin Route has the least extent of undesirable steep grade--sharp curve combination with one 5 degree curve, 0.4 mile long, on 5% grade at Mile 147.3. Nez Perce has 2.5 miles of 5% grade and 5 and 7.5 degree curves east of the Moose Creek Interchange site. Although it is not part of the new construction, Homestake Pass on I-90 adds many undesirable curve-grade combinations to the Whitetail and Boulder Valley Routes. On the west side of the Pass there is a continuous series of reversing curves most of which are 5 degree curves, extending for two miles. These occur in a 3 mile section of sustained profile grades of 5% and 6% from Mile 117 to Mile 120. The 5.5 mile section from Mile 122.5 to Mile 128 has continuous grades of 5.5% and 6%. Between Miles 123 and 125 these steep grades are combined with 6.5 degree horizontal curves.

3. Route Continuity. The Basin Route and the Nez Perce Route provide better route continuity for the Interstate user traveling north or south between Dillon and Helena or beyond these points. The vicinity map and the Study Area Index Map in the beginning of the report show this clearly. For example, traffic bound south from Helena and Boulder using the Whitetail or the Boulder Valley Route would, when they reach the point of intersection of I-15 and I-90, be faced with the decision as to whether it would be more desirable to travel west an additional 29 or 39 miles respectively to Nissler Junction where I-15 turns south, or whether a more direct route through Twin Bridges to Dillon south would be to their advantage. If they chose the shorter route through Twin Bridges, they would be subjected to the added safety hazard of the two-lane highway. The routing of I-15 from Butte to Dillon is well established along the routing of highway U.S. 91.

Most of this 66 mile section is completed or under contract for construction.

The Butte to Boulder driver suffers the same disadvantage of not being provided with a reasonable Interstate route to travel if the Whitetail or Boulder Valley Route were built.

G. HIGHWAY SERVICE TO HIGHWAY USERS.

1. Route Length. Three existing transportation corridors between Butte and Boulder are included in the feasibility study for Interstate 15. All three have continuous roads through them which are available to and in use by highway users. The other route chosen for study for I-15, the Nez Perce Route, is not presently a transportation corridor. The likelihood of the Nez Perce Route becoming a transportation corridor in the foreseeable future is small unless it was selected for Interstate construction.

Of the three present corridors, the Basin Route best serves the highway users as the shortest and most direct route connecting completed sections of I-15 at Butte and Boulder. Compared to the 35.6 mile length of the Basin Route:

(a) The Nez Perce Route (28.6 miles) is 7 miles or 20% shorter

(b) The Whitetail Route (44.1 miles) is 8.5 miles or 24% longer

(c) The Boulder Valley Route (58.7 miles) is 23.1 miles or 65% longer.

2. Road User Route Selection. The road user presently has a choice of three routes between Butte and Boulder. This choice, based on his needs and desires for highway travel, will reflect his considerations of economics, safety, travel time, scenic values or other amenities.

Often in route studies it is difficult to ascertain which particular route the users of the potential facilities want and which will best serve their needs. The present users have clearly indicated by use which route they prefer.

With the exception of the Nez Perce alternate, each proposed I-15 route roughly parallels an existing route. The existing Boulder Valley highway (FAS 281) and the existing Basin highway (U.S. 91) are both paved 2-lane roads in approximately equal condition. Almost half of the total Boulder Valley Route length consists of the constructed 4-lane Interstate 90 facility. It is recognized that the existing Whitetail Road (FAS 399) is a lower standard gravel facility which would tend to discourage its use. An analogy can, however, be made with the Basin and Boulder Valley Routes comparison.

Traffic volumes as shown on Figure 8 in Section II indicate that in 1970 the average daily traffic (ADT) on FAS 281, the present 2-lane highway south of Boulder, was 551 vehicles per day while the ADT on U.S. 91 through Basin was 1063. An Origin-Destination survey taken by the MDOH prior to this study, in which drivers were stopped and interviewed, shows that of the daily total of 551 vehicles, only 9 autos and only 2 trucks on FAS 281, the Boulder Valley highway, were traveling between Butte and Boulder each day. Over 700 autos and more than 170 trucks per day were indicated by interviews as travelers between Butte and Boulder on U.S. 91 through Basin. This is a clear indication that the Basin Route is considered by the driver to be the only reasonable route between Butte and Boulder.

It is reasonable to expect that if Interstate type facilities were to be built along the Boulder Valley Route and along the Basin and Whitetail Routes so that the driver again had a choice of equal facilities, he would almost without exceptions choose the shorter Basin Route. Further reasoning shows that if I-15 were to go through Basin, thereby providing a superior facility along this route, there would be no question but that virtually all Butte-Boulder traffic would select this path. Conversely, it appears logical that if the Boulder Valley or Whitetail Routes were used for Interstate, a large percentage of drivers would still use the more direct U.S. 91 between Butte and Boulder.

3. Route Length Convenience. In addition to the higher operating cost for the greater lengths of the Boulder Valley and Whitetail Routes, the inconvenience to the driver for the added travel time and driving effort must be considered. The additional cost to the road user for the added mileage length has been considered in the road user analysis under Highway Economics. The inconvenience to the driver would amount to an additional 82,000,000 vehicle miles on the Whitetail Route, and an additional 184,000,000 vehicle miles on the Boulder Valley Route compared to the Basin Route travel mileage over a period of 20 years. This would be an unnecessary burden to place upon the users of the facility.

4. Traffic During Construction. Maintenance of traffic during construction would be easier and less costly on the Nez Perce Route than on any other because traffic could be routed on U.S. 91 throughout the construction period. The Whitetail Pass and Boulder Valley Routes, however, would experience only slight and moderate difficulty respectively in this regard.

Many sections of the Basin Route would present no serious problems for maintenance of traffic. These areas include the Butte-Elk Park Pass add 2-lane section, the Elk Park flats area and the areas where independent alignment is proposed. Other areas would present more difficult problems such as the horeshoe curve west of Basin, the narrow canyon area east of Basin and the section from Shamrock Campground south to the mouth of Bison Canyon. Even these areas would cause mory inconvenience to the contractor than to the road user since the Montana Department of Highways requires that paved detour roads be provided and that minimum time delays to travelers be incurred. The inconvenience to the contractor is reflected in the cost of construction and has been considered in the cost estimates.

5. Conservation of Energy. The recent fuel shortages have forcefully pointed out the importance and the urgency of conserving the energy available to transportation oriented uses. Based on the mileage figures presented in the foregoing paragraph Number 3, and assuming an average of 12 miles per gallon for fuel consumption, the additional fuel required for twenty years of travel on the I-15 Whitetail Route would amount to an estimated 6,800,000 gallons and for the Boulder Valley Route would amount to over 15,000,000 gallons.

The construction operation also requires energy in the form of fuel consumption. The alternates which are the most costly would require the most energy for construction. This quantity would be considerably smaller than that used by vehicle operators during twenty years highway operation.

ROUTE SELECTION

On the basis of the input and analysis of the interdisciplinary team and the foregoing evaluations, it is recommended that Alternate 1, the Basin Route, be selected for design and construction for the Interstate highway between Butte and Boulder.

The foregoing Route Selection Study has been devoted to an in-depth analysis of the social, economic and environmental consequences that would result from the construction of any one of the four alternate routes. These subject areas are very important and an objective route selection could not be made without having thoroughly evaluated these in compliance with the National Environmental Policy Act. The basis for considering reasonable alternatives is to insure that the relative objectives in Interstate route selection are fulfilled.

The public as highway users, which includes a large majority of the citizens of this Nation who through road user taxes pay for the construction, maintenance and operating costs of our highways, are best served by the authorized State and Federal highway authorities when these officials provide the best facility to suit the users needs at the lowest cost while giving due consideration to non-highway factors.

The U.S. Public Law on highways sets forth provisions and factors as guidelines and criteria. These include the favorable considerations for local needs, connection of cities by routes as direct as practicable, service to local communities efficiently and effectively, providing direct and convenient public access to public airports, community cohesion, availability of public facilities and services, adverse employment effects, tax and property losses, injurious displacement of people and businesses and disruption of desirable community and regional growth.

In the aggregate the Basin Route would best fulfill the objectives listed and furnish safe, fast, and efficient transportation. For safety the Basin Route would provide the facility which would incur the lowest economic losses from highway accidents for the 1971 cost basis. Cost projections to future years would show substantially higher amounts. Aside from the dollar value is the higher loss of human lives than can be projected to occur with the Whitetail or Boulder Valley Routes.

The Basin Route would serve as the optimum fast, efficient Interstate link when elements of route length, highway economics, directness of connection with existing I-15 at Boulder and Butte and traffic desires are considered in combination.

The socio-economic benefits in terms of public economic welfare for the maximum number of people affected strongly favors the Basin or Nez Perce Routes. Either of these routes would produce a substantial beneficial effect on the Butte community, and the selection of either Whitetail or Boulder Valley Routes would result in adverse effects on the Butte community.

The total human environment would receive a net benefit with the Basin Route but not without some loss in the natural environment aspects as evaluated.

It is concluded that the potential benefits to the public strongly outweigh the disadvantages of the Basin Route and the aggregate of all aspects relative to the favorable and unfavorable elements of the other three routes results in the classification of the Nez Perce, Whitetail, Boulder Valley and no-build alternates as imprudent and unfeasible considerations.

PHASE 2

IMPACT OF THE PROPOSED ACTION

Page

PHASE II - IMPACT OF THE PROPOSED ACTION

INTRODUCTION -- 527
FINAL ENVIRONMENTAL/SECTION 4(f) STATEMENT SUMMARY ----------- 528 to 531
SECTION 4(f) DETERMINATION ------------------------------------ 532 to 535
IMPACT BY TOPIC
    Socio Economic Activity -------------------------------- 536
    Railroads and Utilities -------------------------------- 538
    Conduct & Financing of Government ---------------------- 539
    History and Archeology --------------------------------- 539
    Pollution -- 540
        Air Quality -- 540
        Noise Levels --------------------------------------- 541
        Water Quality -------------------------------------- 541
    Public Health & Safety --------------------------------- 542
    Fish and Wildlife -------------------------------------- 543
    Geologic Aspects --------------------------------------- 543
DESIGN FEATURES
    Introduction --- 545
    General -- 546
    Design Details --- 547
        Earthwork -- 550
        Channel Studies ------------------------------------ 551
        Figure 18 - Peak Flow Design Chart ----------------- 552
        Figure 19 - Mean Stream Velocities ----------------- 553
    Possible Modification of Design Details ---------------- 555
    DeJure and DeFacto Recreation -------------------------- 564
    Mitigating Adverse Effects on Fisheries ---------------- 565
    Potential Impact on Historic Sites and Structures ------- 567
    Special Considerations and Techniques------------------- 568
    Construction Guidelines for Environmental Impact Reduction --- 571
    Design Improvements for Environmental Impact Reduction--- 573
        Figures 20 to 27 ----------------------------------- 574 to 581
EFFORTS TO MINIMIZE HARM -------------------------------------- 582
IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES ------ 582
IMPACT ON THE ENVIRONMENT ------------------------------------- 583
ENVIRONMENTAL DAMAGE WHICH CANNOT BE AVOIDED ----------------- 583
ALTERNATIVE ACTIONS AVAILABLE --------------------------------- 584
RELATIONSHIP BETWEEN SHORT TERM USE AND LONG TERM PRODUCTIVITY- 584
SUMMARY OF FINDINGS AND CONCLUSIONS PHASE II ----------------- 585
APPENDIX TO PHASE II -- 587 to 591

IMPACT OF THE PROPOSED ACTION

INTRODUCTION

The Phase II Study is a more detailed examination of the selected Basin Route. It contains the Final Environmental/Section 4(f) Statement Summary and the Section 4(f) Determination. Impact by topic is the section which deals with the environmental impact related to each category studied.

"Design Features" contains the recommendations made by the Engineering Consultant with respect to general alignment and specific site locations. Further recommendations were made by the Environmental Planning Consultant, for the selected Basin Route, to provide a means of further reducing adverse impact on the natural environment

Examination of all available mapping and plans, in addition to field examinations made by both consultants, is the general basis for the recommendations.

The Montana Department of Highways estimates that the Basin Alternate would be constructed under six separate contracts which would begin at different times. The estimated contract dates are as follows:

Butte North (add 2-lane)	July 1978
Woodville North	Feb. 1974
Elk Park South	Feb. 1974
Elk Park - Bernice	July 1978
Bernice - Basin	July 1977
Basin - Boulder	Feb. 1976

FINAL ENVIRONMENTAL/SECTION 4(f) STATEMENT SUMMARY

1 - Administrative Action	Final Environmental/Section 4(f) Statement
2 - Description of Highway Improvement	Design and construction of a 30 mile section of 4-lane Interstate and a 5 mile section of add 2-lane Interstate beginning at Butte and extending north and east to Boulder. The project is identified as 1-15-2(23); 1-15-3(10), (11), (12), (13),(2) in Silver Bow and Jefferson Counties, Montana.
3 - Environmental Impact	The beneficial effects include providing a safer more efficient transportation system for the highway user as well as providing economic benefit to the cities of Butte, Helena, Boulder and Basin. Some physical alteration to Boulder and Bison canyons would occur due to cuts. Considerable channel realignment would be necessary on Bison Creek and the Boulder River. Some reduction in access to abutting lands and the streams would result as well as would moderate damage to vegetation. Three camp grounds would be taken and replacement facilities would be provided.

4 - Alternatives

Four alternate routes plus a no-build alternate were considered. These are evaluated in the Phase 1 section of this report.

5 - Agencies Contacted

The following agencies, organizations and individuals were furnished copies of the Draft Statement. An asterisk (*) indicates a response was received:

* Department of Interior

* U. S. Forest Service

* Montana State Department of Health & Environmental Sciences

* Postmaster, Basin, Montana

Montana Department of Planning and Economic Development

* U. S. Army, Corps of Engineers

* State of Montana, Department of Fish and Game

* Postmaster, Butte, Montana

Postmaster, Boulder, Montana

Montana Council of Natural Resources & Development

Montana Department of Natural Resources Conservation

Silver Bow County Commissioners

Honorable Jim Streib, Mayor, Boulder, Montana

Jefferson County Superintendent of Schools

Agricultural Stabilization and Research Service, Bozeman, Montana

Rural Electrification Administration, Great Falls, Montana

* Department of Housing and Urban Development

* U. S. Geological Survey

* Jefferson County Commissioners

* Honorable Mario Micone, Mayor, Butte, Montana

Butte City-County Planning Board

* Silver Bow County Superintendent of Schools

* Environmental Quality Council, Helena, Montana

Federal Power Commission

* Soil Conservation Service

Department of Health, Education and Welfare

Environmental Health Service and National Institute of Environmental Health and Sciences, Helena, Montana

* National Park Service

* Environmental Protection Agency

* Economic Development Administration

Vincent Yannone, Clancy, Montana

Harriet Miller, Butte, Montana

John McBride, Missoula, Montana

Chamber of Commerce, Butte, Montana

Room 212 of Venture Center, Butte, Montana

Representative Dorothy Bradley, Bozeman, Montana

* U. S. Department of Agriculture

6 - Availability The Draft Statement was made available to C.E.Q. on May 25, 1972.

SECTION 4(f) DETERMINATION

Section 4(f) lands can be described as publicly owned recreational areas having local, state or national significance. It may also include lands from an historic site. A description of 4(f) lands along all the route corridors appears in Section I, Description of Alternates.

The proposed Basin Route would eliminate the Bison Creek picnic area and require use of approximately 2 acres from the Elk Park campground and 2.7 acres from the Shamrock campground. It would also eliminate vehicular access to the remainders, thus precluding their further use as campgrounds. These campgrounds have local significance only as determined by the U. S. Forest Service, the controlling agency.[1] Accordingly, approval of the Basin Interstate project is permitted by Section 138 of Title 23 U.S.C. only if --

(1) there is no feasible or prudent alternative to the use of such lands, and

(2) such program includes all possible planning to minimize harm resulting from such use.

This statement, therefore, sets forth those determinations pursuant to Section 4(f) of the Department of Transportation Act and Section 138 of Title 23, U.S.C.

Three alternate route locations were studied which would not require use of these campgrounds. The alternative of not building the highway was also considered.

These alternatives were found to be neither prudent nor feasible. This determination is based on the impact ratings and the considerations which are covered in Phase I, Section VII, "Evaluation and Route Selection." They include evaluations of the effects on all alternate routes in the fields of Engineering, Environmental Planning, Economics and Sociology. Public opinion was also a consideration. They are the same reasons which were used as the basis for selecting the Basin Route as the most desirable alternate.

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[1] U.S.F.S. letter dated Aug. 23, 1973 - see Appendix

Variations of highway alignment in the Basin corridor which would avoid use of the campgrounds were also studied, but such variations were limited by the canyon width in which the campgrounds are located and would result in increased environmental damage. Consideration was also given to providing access to the remainders of the campgrounds through rest areas which would be constructed at these sites. The U. S. Forest Service felt that this was not consistent with its present policy, and that relocation would be a preferable solution.[1]

The rest areas planned for construction at the sites of the Elk Park and Shamrock campgrounds could be constructed at other locations, leaving the existing campgrounds essentially intact. However, access to both campgrounds from planned Interchanges would be costly to construct, would cause added environmental damage and would be highly inconvenient for the user. The original purpose of these sites was to provide a stopping place for the traveler and the local user where he could enjoy a forest experience in a natural environment. Perpetuation of the use of these areas in conjunction with Interstate 15 would not be compatible with this concept. The U. S. Forest Service concept of the campground-picnic area has changed in recent years to the more modern one of providing a forest experience for a highway traveler in areas somewhat removed from the main hustle and bustle of highway noise and traffic. It is geared toward more of a destination type camping area, so that a traveler can have a day or two of rest. It is therefore concluded that it would not be prudent to construct access roads to these campgrounds and that relocation would be more desirable and in keeping with present U. S. Forest Service policy. Noise level measurements were taken at both Elk Park and Shamrock Campgrounds and the results are shown on Table 17 in Section III. The measurements show that noise levels are within allowable standards but highway noise is plainly audible anywhere in the campground and is objectionable. A more remote site would certainly offer a much more serene condition. Noise would obviously increase at these sites due to the expected traffic increases whether or not the Interstate is constructed along this route.

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[1] U.S.F.S. letter dated Mar. 21, 1973 - see Appendix

A suitable replacement site in the national forest in Section 18, Township 4 North, Range 6 West, known as the Cinderella site, has been selected by the U. S. Forest Service for a replacement campground.[1] This site is in the foothills near Nez Perce Creek on relatively flat terrain, surrounded by moderate stands of timber. There are several open areas within the campground. The site is approximately one mile east of the planned Trask Interchange, and an existing road from the Interchange would afford convenient access. The campground site is far enough from the highway that the camper would not be affected by highway traffic or noise. This location would afford the type of use required by both local people and the Interstate traveler and would be more consistent with the Forest Service concept of its campgrounds The new site would fully replace the need for the Elk Park and Shamrock campgrounds and the Bison Creek picnic area.

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[1] U.S.F.S. letter dated July 19, 1973 - see Appendix

The available replacement area exceeds the combined areas of the existing campgrounds, and is of a size sufficient to develop 80 to 100 camp and picnic units Since it is located on public land presently administered by the U. S. Forest Service, land acquisition would present no problem. No cost estimates have been made for development of this campground, but the State's authority includes expenditure of funds reasonably necessary to replace or relocate the facilities from the Elk Park and Shamrock campgrounds and Bison Creek picnic area. Planning and development of the new campground would be coordinated with the U. S. Forest Service. It is contemplated that landscape architects would be employed or consulted in designing the campground and the facilities would be constructed insofar as possible to maintain harmony with the existing environment. It is anticipated that relocation of the campgrounds would be completed prior to commencement of construction of the highway so that availability of campground facilities would not be interrupted.

No further use is presently planned for the remainders of the Elk Park and Shamrock campgrounds. If no practical plan for their continued use is found, the improvements would be removed and the sites restored insofar as possible to the natural state.

It is, therefore, determined that there is no feasible or prudent alternative to the use of the Elk Park and Shamrock campgrounds and the Bison Creek picnic area, and that all possible planning measures to minimize harm have been considered.

IMPACT BY TOPIC

SOCIO ECONOMIC ACTIVITY

The communities which would be directly affected by the construction of the recommended Basin Route are Butte, Basin and Boulder.

The Butte metropolitan area has a population of 40,700 according to the 1970 Census, and is located on the west slope of the Continental Divide. Its economy has evolved from and is principally dependent on the mining industry. As the largest community along this route, Butte is also an important regional marketing center for the Whitehall, Dillon, Deer Lodge and Boulder region. Transportation oriented industries play an important role in Butte's economy. Construction of the Basin route would provide an improved highway facility which would benefit both the existing industries and the new and growing "Port of Butte" import-export warehousing facilities.

The short term economic impact on Butte would be beneficial concerning retail trades, housing, services, finances and other businesses. Long term beneficial impact to transportation related industries, wholesale trades and the general business community would result. Social systems are adequate to absorb both long term and short term increases. No displacement of people nor impact on minority groups would occur.

The culture and economy of the unincorporated community of Basin (population 96) is based largely on tourists and recreation oriented trade. A considerable number of people are attracted to the several "Health Mines" in the area. The rural community supports a small number of economically marginal businesses. Other than the Pacific Silica Company's operation, local mining activities contribute very little to Basin's economy.

Short term beneficial impact on Basin would result due to construction activities if the recommended Basin alternate were constructed. This would affect retail trades and local services. Schools, housing and other services may be inadequate for significant increase in population over the short term. Five families in Basin would require relocation. Decent, safe and sanitary housing is not currently available, but could be developed under the Montana Department of Highway's Relocation Assistance Program. Long term economic loss may occur from construction of the proposed facility due to the by-pass of traffic on the Interstate when compared with the present condition. The effect when compared with other alternates would be less adverse.

The culture and economy of Boulder, an incorporated city of 1,348 people, is primarily related to the Boulder River School and Hospital, a State-owned and operated institution. Secondary sources of income to the economy originate from agricultural products and other important components of the economic system which are tourism, recreation, mining and governmental activities. Significant amounts of outside money flow into the community seasonally from tourists attracted to the area by health mines.

The short term impact on retail trades, services, finance, and other businesses would be beneficial. No relocation of people or businesses nor impact on minority groups would occur. The long term impact on the city as far as tourism is concerned, may be adverse due to the bypass of traffic on the Interstate. Social systems and housing would probably be inadequate for significant short term increases of population.

The irreversible and irretrievable commitments of resources which would occur along this recommended route are expected to be minor. Six hundred eighty acres of agricultural land are required for right-of-way. The only other resource which would be affected is mining. Some reduction in access to mining properties would result along the narrow band of construction, but present mining activity in the area contributes very little to the economy.

Since the Interstate bypasses Boulder and Basin, the effect on tourism may be adverse. However, construction of this Interstate route may increase the volume of tourists passing through the area, and this may tend to counteract the adverse impact.

The socio-economic study prepared by the Department of Highways is included in the Phase I section of this report, and contains a detailed analysis of the economic considerations along this route.

RAILROADS AND UTILITIES

The Burlington Northern Railroad presently operates from the community of Basin to Boulder and on north. This facility previously extended all the way to Butte but has recently been abandoned between Butte and Basin, and although the railroad grade remains, the tracks and structures have been removed.

Studies were completed to determine what advantage might be gained from the use of the abandoned railroad right of way in constructing an Interstate Highway along this route. It was determined that considerable advantage would be gained in reducing the environmental impact along the route and in reducing total construction costs. It would also be possible to use portions of the old railroad grade to provide access to the river for fishing and to other areas. The railroad embankment can be removed where necessary to provide more room for beneficial treatment of stream channel alterations and to allow less restrictive design controls for highway alignment.

There are telephone and power transmission utility lines along various portions of this route, some of which will require relocation This will result in some alteration to the environment, primarily in the form of timber clearing.

The impact of this proposal on railroads would be negligible and the impact on utilities is considered moderate No relocation of the railroad is anticipated and even though portions of the utility lines will require relocation, no reduction in service is expected.

CONDUCT AND FINANCING OF GOVERNMENT

The socio-economic statement which appears in Phase I of this report indicates that the county and city governments affected show a healthy financial condition. Of the 1,057,000 acres in Jefferson County, 54% are National Forest lands, and another 10 to 15% non-taxable public lands. The most significant impact which would occur on the Basin route would be the buildings taken in the town of Basin Right-of-way required for construction of this route is not expected to affect the tax base of the county appreciably.

The tax table appearing on page 371 of the Socio-Economic study, shows taxable versus non-taxable lands for the recommended Basin alternate

HISTORY AND ARCHEOLOGY

The "Natural Environment" appearing in Section IV, Phase I of this report contains a detailed account of the historical and archaeological aspects of the construction of this proposed route.

There are sixteen identified historical sites in or adjacent to the Basin corridor A number of these would be directly affected by construction activities, but none of the sites are rated as having more than local significance. There are no areas along this route which are listed in the National Register of Historic Places, and there is no conflict with the National Historic Preservation Act.

There are no identified archaeological sites along this route. However, it is recommended that routine salvage archaeological reconnaissance be made in the usual manner.

POLLUTION

Pollution studies which were conducted with respect to this route include air contaminants, water quality and noise levels, both on a temporary basis during construction of the project and on a long term basis as a result of the added vehicular activity due to the improved facility.

Air Quality. The studies which are shown in Section III, Phase I of this report, indicate that long term air pollution resulting from vehicle emissions, would not be produced in sufficient quantities to produce serious problems. Also, it is expected that regulations resulting from present and future Federal regulations will reduce the volume of emitted pollutants even below the levels expected at this time. Section III, Phase I of this report entitled, "Engineering and the Environment," contains tables showing predicted amounts of pollutants as a result of the vehicle emissions (Table 13 and Figure 17).

Air pollution produced during the actual construction process will primarily be generated from hot plant operations and from dust resulting from earthwork operations. The Montana State Department of Health and Environmental Sciences is the controlling agency which enforces air quality standards adopted by the Montana Legislature.

The environmental impact resulting from the construction of this project relating to air pollution is not expected to be serious, and would be no more than would be expected on any other project of a similar type

Noise Levels. Noise level calculation predictions were made at specific locations along the planned Interstate routes Also, actual noise level measurements were taken along existing U S 91 These values are shown in Section III of Phase I on tables 14 and 17 The results indicate that noise levels are in general, well below those standards set up by the Federal Highway Administration in their Policy and Procedure Memorandum No. 90-2.

Water Quality. The water quality of Bison Creek and the Boulder River along the construction route would be temporarily impaired due to the construction operation. The primary adverse effect that is expected would be increased turbidity due to channel alterations and other construction operations

The Montana Department of Health and Environmental Sciences is charged with maintaining water quality criteria standards as adopted by the State Water Pollution Control Council The Montana Department of Fish and Game has the responsibility of enforcing the requirements of the Stream Preservation Act, and the Montana Department of Highways regulates the amount of exposed cut area which can be open at one time, and requires that proper precautions be taken against erosion and against runoff from cut slopes which could cause increased turbidity in the stream waters The guidelines for these controls are outlined in FHWA Instructional Memoranda, 20-3-66, 20-6-67, and 20-3-70 Compliance would be accomplished by including details in the plans such as construction of short sections of stream alteration at one time to reduce turbidity

Measures which would be taken to reduce the effect of increased turbidity from construction activities include the possibility of compacting channel bottoms in channel change areas as well as the possible placing of an armor type coat of clean gravel to trap sediment during the time when the stream is first routed through the new channel It is also planned that construction activities in or adjacent to stream channels be scheduled during low flow periods. This would permit easier routing of the stream and construction activities where there is adequate room and the resulting lower velocities would result in less turbidity The adverse effect of these activities is expected to be temporary.

The primary alternative actions which were investigated were efforts to minimize the amount of construction affecting streams and efforts to adjust roadway alignments to reduce the amount of stream encroachment.

Stream Channel Studies which are in the following "Design Details" section discuss the subject of channel alterations.

PUBLIC HEALTH AND SAFETY

It is believed that there will be no adverse impact related to public health and safety, nor will there be on law enforcement Fire fighting equipment access to inhabited communities involved such as Boulder, Basin and Butte, should be improved as a result of the construction of this proposal since it will provide a faster, safer and more efficient facility Fire attack time to forest areas will be improved.

Improved safety to the public will be provided because of the safer driving conditions encountered on this 4-lane controlled access facility Accident rates on a 2-lane facility such as existing on U. S. 91, are inevitably higher than can be expected on the new facility

FISH AND WILDLIFE

The effect on fish may be temporarily severe where channel alterations are required Stream channel treatments discussed in the previous "Water Quality" section, as well as measures discussed and sketched in the "Impact Assessment" section should largely correct these ill effects over the long term

Wildlife would be only moderately affected in that a small amount of browse area for larger animals and cover for smaller animals and birds would be removed within the construction limits. No game migration routes would be interrupted.

GEOLOGIC ASPECTS

The mountains along this route are primarily composed of the igneous intrusion known as the Boulder Batholith, which is believed to have developed during the geologic early tertiary period This intrusion extends from Helena for 60 miles to the area south of Butte, and encompasses the entire Basin route The only rock older than the Batholith is an andecite near the town of Basin At no time does the roadway cut very deeply into the Batholith proper but lies near the root with consequent variations in composition and texture and numerous zenoliths.

After the close of the Cretaceous period, the entire area was subjected to prolonged and strong erosion During Eocene time, the entire area was eroded level. This plain has since been uplifted and faulted The Batholith has been cut by numerous dikes and covered by lava flows and tuffs and breccias The present valleys are most controlled by faulting which has been extensive, and are relatively new erosion features All valleys have steep walls and are narrow with steep gradients except those like Elk Park which are remnants of the old summit peneplains. Slides can be seen in the valley walls. An especially prominent one can be seen from the present road. It is south of the ranch buildings approximately one mile east of Bernice.

Inspection of the Basin route shows that the valley bottoms are filled with relatively shallow deposits of sediment derived locally from the Boulder Batholith, with some local areas receiving influence from tertiary age volcanics. The clastic sediments of these valleys are chiefly composed of silty sand with gradations ranging from feldspar derived clays on the fine fraction of boulders on the large end. From previous experience with sediments derived from the Boulder Batholith, the soils will probably be in the A-4 to A-6 range (MDH Standard Specification Classification). The A-6 soils tend to be frost susceptible, especially at higher elevations, the clays to be lean (non-swelling) and a great percentage of the boulders to be quite erodable. High sand content should make fill consolidation a negligible problem.

In the areas where colluvium and talus are intercepted, the maximum allowable steepness of backslope should be 1:1 in cuts less than 10 feet in height and 1½:1 in deeper cuts.

Where rock is intercepted in cut zones, much variation will exist as to maximum allowable steepness for backslopes. Generally speaking, prominent joint systems should be followed wherever they are parallel to the road and could possibly offer a plane for backslope failure. Natural saddles are usually zones of intense fracturing or zones of decomposition, which may be as deep as 200 feet. Backslopes made through these zones may be variable, but past experience has shown that 1:1 or 1½:1 slopes are advisable depending on cut height.

The geologic map in this section shows the general geologic composition of the area and it shows major known fault zones. Faults will undoubtedly control some backslopes, but no active movement along these faults has been recorded and no movement is anticipated. Some of the more stable rock zones may possibly stand at ¼:1 with proper presplitting techniques, but other areas would indicate that ¼:1 slopes would be the exception rather than the rule.

Previous experience and calculations indicated that the silty sand overburden will probably have a shrink-swell factor of 0.95. The rock may have a shrink-swell factor of about 1.05.

No special design techniques are thought to be necessary in the design of the roadway section due to possible seismic forces. However, as is common practice, bridges and other major structures will be designed to withstand seismic load.

DESIGN FEATURES

INTRODUCTION

This section deals with two aspects of design. The portion entitled "Design Details" explains certain features of the roadway design which were studied during the development of this route alignment. These features plus those described in Section I, Phase I, "Description of Alternates," were the basis for the cost estimates. They were also features on which the environmental impact evaluations in Phase I were based and they are the recommendations of the Engineering Consultant which were developed during preliminary design studies.

The Environmental Planning Consultant then examined the selected route and the subsection entitled "Possible Modifications of Design Details" contains his specific recommendations as to methods which would reduce adverse impact on the environment of the Basin Corridor. These recommendations were made as a result of their studies and field inspection. The studies and the resulting recommendations were made in close cooperation with the Engineering Consultant and are endorsed by both.

It must be recognized that these recommendations are based on preliminary studies and actual implementation must await final detailed design studies as well as the approval of all agencies charged with the responsibility of final decision making. Since it is impossible to determine which improvements will be implemented, no costs are included.

A detailed study and analysis was made of preliminary and alternative alignments, profiles and cross sections. This review revealed a number of possibilities for mitigating some of the environmental impact, such as some changes in alignment and cross sections, modifications of drainage structures and possible relocations of the Galena Gulch Interchange. These changes were carefully checked in the field to the extent and detail possible with the preliminary plans and profile sheets which were available. Modifications of the alignment, profile and/or cross sections discussed in this report are meant to indicate areas where further detailed study seems justified and where the end result might well be worth the additional effort from the standpoint of reducing the environmental impact.

GENERAL

On a four-lane divided highway the median can vary from a simple barrier to widely separated independent alignments. For the purpose of this study when reference is made to a narrow median it means the centerlines of the two opposing roadways are 38' apart and a barrier rail is used for separation. When referring to a standard median it means the centerlines of the two roadways vary from 70' to 150'. A split alignment means each roadway has an independent alignment and profile.

DESIGN DETAILS

Mile 130-134. The five mile section of the Interstate between the East Butte Interchange and Woodville Pass consists of an add 2-lane design, since the initial two lanes have previously been constructed. This section consists of a sidehill cut-fill situation almost throughout the entire length and little opportunity for variation in design exists. Under the Montana Department of Highways program of Safety Upgrading, the existing two lane would be subject to improvements such as guard rail, slope flattening and the addition of other safety features at the time of construction of the add two lanes.

Mile 134-143. From Elk Park Pass to the mouth of Bison Canyon the alignment will cross the Elk Park Flats and generally follow the center of the valley. Here the profile would be kept near the ground and be elevated only enough to alleviate the existing problem of drifting snow. The environmental damage to this section of natural terrain is expected to be low.

Mile 143-145. Here the roadway would follow the narrow winding Bison Creek Canyon. A divided independent alignment is planned with each pair of lanes traveling down the opposite sides of the canyon. Environmental impact here in the form of sizable cuts along the relatively heavily forested side slopes cannot be avoided. However, considerable advantage will be gained because the Burlington Northern Railroad abandoned their grade between Butte and Basin and it is available for highway use. Here it is planned that the stream be carried between the lanes through part of this length. Efforts to minimize harm through this section consisted of careful manipulation of the alignment and grade to reduce the size of hillside cuts and to reduce the extent of channel alteration as much as possible. A narrow median alternate was studied in this area but was discarded because of safety and ease of driving.

Between these limits an alternate alignment was also investigated which would carry the southbound lanes to the north of Bison Canyon, while the Northbound lanes would remain in the canyon bottom. Preliminary studies showed that the environmental impact in the form of heavy cuts and fills would be more severe than the presently proposed design.

Mile 145-148. At mile 145, a rest area is planned to serve the north bound lanes. This is at the site of the Elk Park Campground, which as described earlier, is to be abandoned by the U. S. Forest Service in favor of replacement campsites at a new location. Here the alignment is divided and this condition continues on to Mile 146.5. From this point a narrow median design is employed to carry the two pairs of lanes down the steep 5% grade to Mile 148 near the existing Shamrock Campground. Here, again, very little variation in alignment and grade is possible because of the steepness of grade and because it is necessary to carry the roadway along the steep sidehill to the east of Bison Creek.

Mile 148-151. Shamrock Campground at Mile 148 would be the planned site of a rest area to serve the southbound lanes. The existing campground at this location is also planned to be abandoned by the U. S. Forest Service in favor of a replacement site at a new location. From this point, the lanes divide and are carried on independent alignment to Mile 151 near the planned Bernice Interchange. The terrain in this area lends itself well to the design of a curvilinear alignment which follows the contour of the ground with the widely separated lanes. At the Bernice Interchange, the lanes converge and continue on to the Mile 153.5 on 100 ft. centers. The lanes are carried on a low fill throughout this entire reach. At the Bernice Interchange, an access road is proposed from the Interchange to the south to serve the Bear Gulch area and to serve State lands along this section of Bison Creek.

Mile 151-156. At Mile 152.5, a formation locally known as Indian Head Rock lies alongside the alignment. Construction in this area will not damage this site in any way. At Mile 153.5 the lanes further converge to again form a narrow median section which carries the lanes through this narrow winding canyon on 7° 30' curvature to the town of Basin near Mile 155.5. Impact in the form of large side cuts on sparsely timbered hillsides through this area would be high due to the restricted size of the canyon bottom, but considerable advantage is gained since the railroad grade has been abandoned through this area. Channel changes in this reach consisting largely of lateral shifting of the channel will be extensive but this entire length of the Boulder River has been previously altered by earlier highway or railroad construction, and the environmental impact here is not as severe as if the stream were presently in a virgin condition. Through the town of Basin, the lanes are carried on the narrow median section to the south of the existing Highway 91. A few homes will require relocation as described in the socio-economic report included in Phase I of this study.

Mile 156-162.5. At Mile 156, the Basin Interchange is provided to give access to Basin and the surrounding area. The narrow median section is carried on through the narrow winding canyon east of Basin to Mile 159. The alignment here consists of a series of back-to-back 7 degree 30 minute curves which are carefully fitted to reduce channel change and cut areas to the maximum possible extent. At Mile 158, the alignment crosses under the Burlington Northern Railroad. Several studies were conducted here to determine the best possible method of crossing which would result in the least environmental damage to the natural terrain. From Mile 159 to Mile 161, the alignment consists of 100 ft. centers and an interchange is planned at Mile 160.5 to provide access to Galena Gulch and the High Ore Gulch area. At Mile 161, the lanes diverge and continue on to Mile 162.5 on divided independent alignment. Throughout much of this reach, the Boulder River is carried between the lanes. At Mile 162.5, the alignment conforms to the existing four-lane Interstate.

EARTHWORK

Preliminary studies were made regarding earthwork quantities which would be required to complete the construction of this route. These studies indicate that in general, excavation and embankment quantities can be made to balance throughout the entire project with the exception of the nine mile stretch across Elk Park Flats which will require additional embankment material from approved borrow sources.

For the highway sections through Bison Creek and Boulder River Canyons to Boulder, the balance of economics and aesthetics must be weighed since it appears that it would reduce costs to borrow material in some areas and to waste in others, rather than to haul the material long distances along the roadway to effect a balance. It appears that suitable borrow and waste sites may be difficult to find especially since it is important to have them located out of sight of the roadway. Excavation quantities from the mouth of Bison Canyon near Elk

Park Inn to Boulder are estimated to be in the range of 6,000,000 yards

CHANNEL STUDIES

Reasonably adequate streamflow records were available for study The records of the Boulder River near Boulder (40 years), Tenmile Creek near Rimini (54 years), Prickley Pear Creek near Clancy (33 years) and other shorter term records provided good information for the use of the Gumbel method of determining the 50 year and lesser floods. This is shown on Figure 18

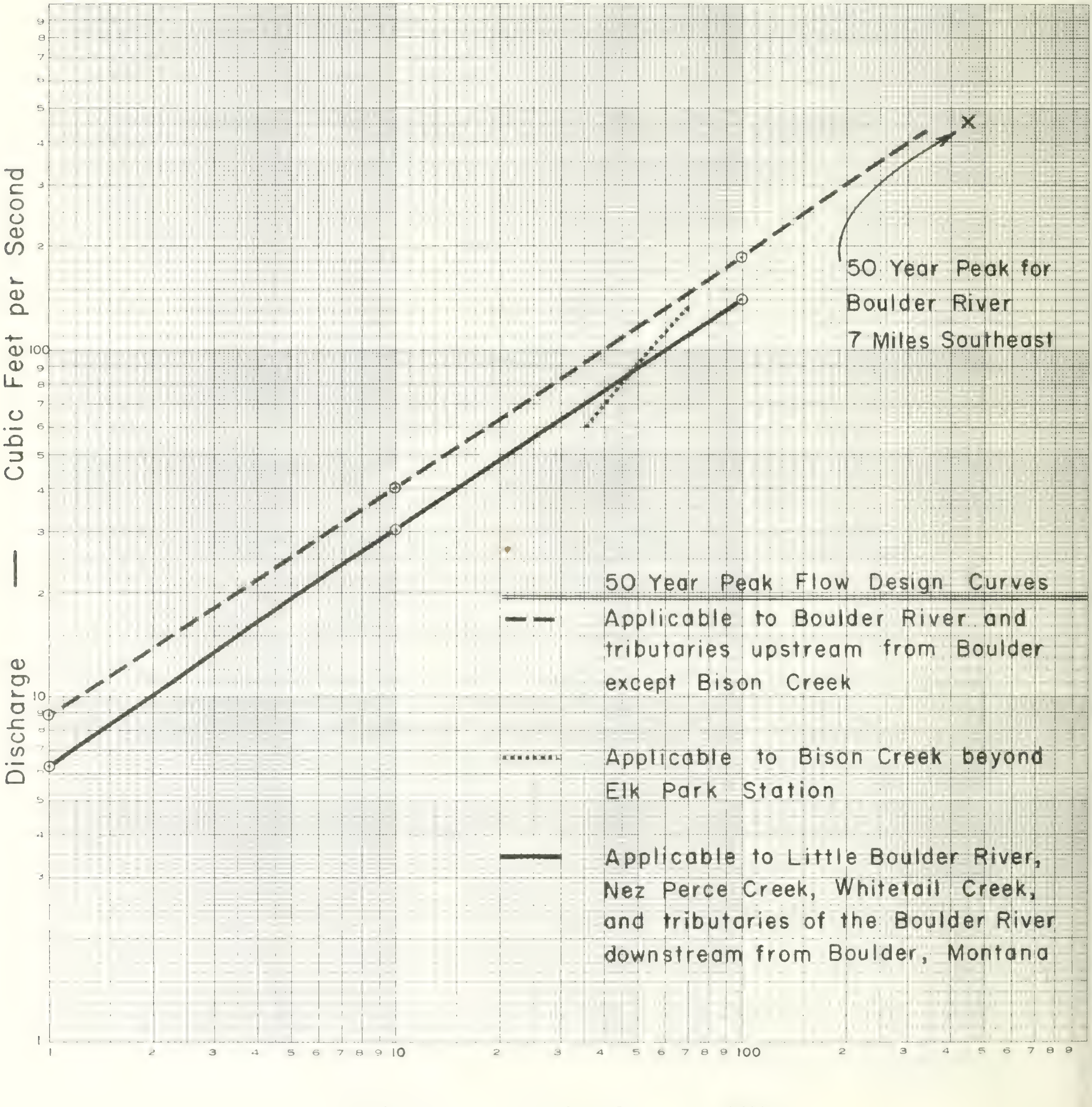
Stream beds were examined for bed material size and related friction to flow. The object of this was to determine the effects of the proposed changes upon the stability and erodability of the bed and banks. Natural channels are not necessarily stable in the long term as is evident by the creation of stream valleys and the movement of sediment, gravel and even boulders during the flood season.

About 22,600 lineal feet of the present Boulder River channel would require change This would be replaced by 18,600 feet of new channel, and 3,200 feet of reclaimed channel. The replacement channel would be about 4% shorter than the existing channel. The reduction in length may increase velocities as much as 10 percent in some of these changes Approximately 30 percent of these changes would be made in replacement of previously changed channels created through earlier railroad and highway construction. The breaching of the abandoned Burlington Northern railroad grade near the mouth of Red Rock Creek and Indian Head Rock would permit the stream to flow again in about 3,000 feet of original channel This would increase the channel length and produce a beneficial effect. The most severe shortening of the Boulder River channel over a considerable reach would occur in the vicinity of the proposed Galena Interchange.

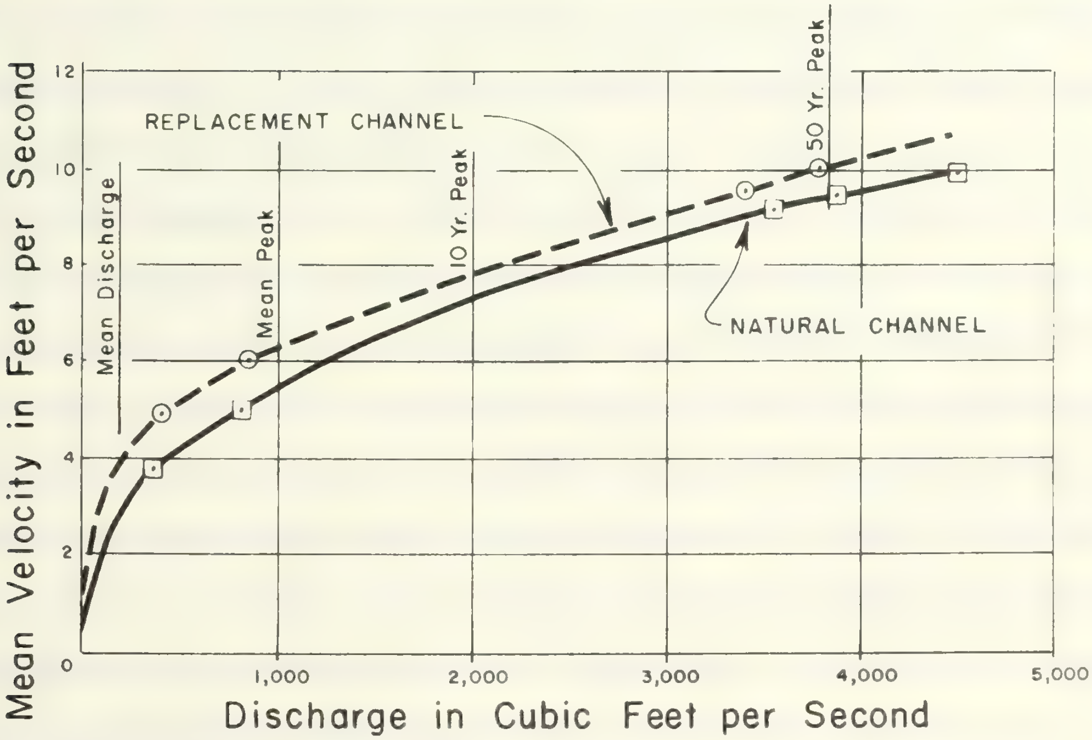
PEAK FLOW DESIGN

Alternate Routes

I-15 near Boulder, Montana



The effect of that channel change on mean velocity at varying discharge is shown on Figure 19. The reduction in length there would be about 17 percent.



COMPARISON OF MEAN STREAM VELOCITIES

GALENA INTERCHANGE AREA NEAR MILE 160.5

Bison Creek from Elk Park Station to the Shamrock Campground would require many changes of the present channel to accommodate an Interstate highway. Many of the changes involve routing Bison Creek between the widely separated lanes of the proposed Interstate. About 20,200 lineal feet of the present channel are slated for change. This would be replaced by 15,600 feet of new channel and 5,100 feet of reclaimed channel. The reduction in length of some changed channel could increase velocities as much as 15 percent. About 55 percent of the changes would be made in replacement of previously changed channel. There is an opportunity to reclaim about 5,100 feet of old channel in replacement of about 1,900 feet of previously-changed channel. Excluding the additional length through reclamation of the original channel, the stream length of Bison Creek would be about 16 percent shorter than it is at present. Present stream gradients vary between about 0.2 of one percent to as high as about 25 percent in the cascading reaches. Very little disturbance of the steepest reaches is planned. Where the channel changes involve use of the median, channel slopes can be kept to about 1.7 percent or less. Average velocities at the 50-year flood would be about 8.4 feet per second if the present character of the stream bed were duplicated. Placement of larger rock or gravel in the artificial channel in the steeper reaches would improve aesthetics and fish habitat without causing flooding of the proposed highway. Eleven culverts are planned on Bison Creek and additional culverts on tributaries. Where velocities in culverts are high, baffles in the lower part of the culverts could provide shelter or resting areas for migrating fish.

The effects of channel changes on hydraulics were investigated at specific locations. A velocity-discharge curve (Figure 19) shows the results of one such study near Galena Interchange. Due to considerable variation in the river cross section, some natural reaches have as high or higher mean velocities than the proposed cross section. In the broader reaches of the natural channel, velocities would be substantially lower than shown on the graph.

In the course of time an artificial channel will tend to reshape itself through scour to lessen the artificial gradient resulting in a minor decrease in average velocities in the changed reach.

When it is desirable to reduce velocities, the stream bed could be roughened by using rock up to 1½ feet in diameter for lining the channel. This would create a greater depth of flow.

Stream meanders, rocks and jetties placed in the stream and various types of bank protection and stream bottom treatment would be used in the channel design wherever possible to reduce the harmful effects of channel alteration. Along both Bison Creek and the Upper Boulder River, it appears there are areas which have been previously channel changed due to earlier highway or railroad construction in which marked improvements can be made through careful channel design and construction. The potential impact on the Boulder River and Bison Creek is considered to be high.

POSSIBLE MODIFICATIONS OF DESIGN DETAILS

East Butte Interchange to Elk Park Pass (Mile 130 to 134)

This section of I-15 has been partially constructed to a one roadway, two-lane standard and is in use. The existing roadway ascends on almost maximum grade from the interchange to Elk Park Pass. Built on a steep side slope the two lanes required heavy cuts and fills with attendant scars. Very little re-vegetation is apparent on either cut or fill slopes.

The two additional lanes were planned when the initial two lanes were constructed. They would be built east of the present roadway on the lower portion of the hill and cross to the west on the upper portion as it approaches the pass. The alignment and grade of the existing roadway leaves little or no leeway to alleviate the maximum gradient and heavy sidehill construction. Present plans are to construct a standard 70' to 110' center to center facility in this section.

Since the alignment and resultant heavy sidehill construction are already fixed, the only thing that remains is to strive for more complete re-vegetation of the cut and fill slopes. The impact on the physiography is severe on this section and the only redeeming feature is that the adjacent portion of the Butte area has already been scarred by mining activities that the additional impact of the second roadway would not be as prominent as it might otherwise be.

(Mile 134 to 143)

The potential environmental impact on this section was rated low in the Phase I study because it follows the alignment of existing U. S. 91.. Plans indicate that a standard median would be used and the profile kept low...Existing vegetation should be preserved to the fullest extent; fill slopes should be re-vegetated with native grasses and the abandoned railroad grade, where available, should be obliterated and re-vegetated where it is not incorporated into the new roadway.

(Mile 143-144)

The possibility of shifting the north bound lane to the east should be studied to avoid destruction of the old railroad water storage pond and the heavily forested rocky hill north of the pond. These two features are well worth saving and the present alignment, if followed, would completely destroy them. No major problem in accomplishing this change was apparent in the field.

(Mile 144 to 145)

It is suggested that the southbound lane be shifted to the south side of the canyon at mile 144 and a narrow median be used, shifting back to independent alignment just west of mile 145. Field review indicated little justification for scarring both sides of the canyon with an independent alignment through this section just to have a wide median. Each scar would be clearly visible from the opposite roadway. By using a narrow median, scars will be kept to one side of the canyon only, and provide the opportunity to reduce the total length of proposed channel change.

(Mile 146 to 147.5)

A narrow median should be used through this section to reduce scars. Center lines should be kept west of the forested rocky knob at mile 146.5. A review of the preliminary cross sections on the proposed alignment indicate that destruction of the forested knob would be practically total. By slight changes in the degree of curvature and tangent length, it appears that much of this feature could be saved. The possibility of using bridges or open bottom arch culverts at the three locations in this section in lieu of pipe culverts should be considered. The combination of a narrow median and a bridge should eliminate the need for the proposed channel change left of the Interstate.

There appears to be no way of lessening the impact of the proposed alignment on the Bison Picnic Area near mile 147.3 which will be obliterated by a 75' fill even by using maximum allowable curvature. Maximum gradient is already required and increasing the curvature from 5^o to 7^o -30' does not help the situation appreciably.

The portion of the roadway between mile 146 to 147.5 would require the heaviest construction and have the highest impact on the environment of any section on the entire route Careful study, therefore, is warranted and every effort should be made to reduce the impact to a minimum.

(Mile 148 to 150)

The southbound lane alignment as now proposed through this section cuts through a number of scattered groups of trees. In the field it appeared that by very minor shifts of alignment many of the groups of trees could be salvaged and the impact reduced correspondingly. It is suggested that the alignment and cross sections on this entire section be carefully restudied with this in mind

On the northbound lane, the possibility of using bridges instead of culverts near mile 148.7 should be considered. This would permit retention of the stream channel in its natural condition and provide easier fishing access to additional sections of Bison Creek.

(Mile 150 to 151)

Sections of the railroad embankment lying in the median should be obliterated where it will not be incorporated into the new construction.

Bernice Interchange (Mile 151)

The northbound off ramp should be studied to see if the alignment can be shifted to save a group of trees at this point. The proposed location of the steel arch culvert carrying the Boulder River should be studied. If the culvert can be skewed to follow the existing channel of the river it will eliminate about 500' of channel change and permit the river to remain essentially in its natural channel.

(Mile 152.5) Indian Head Rock

Much of the effectiveness of this interesting rock formation is lost because of the dilapidated fence, power line, chewed-up slopes and graffiti at its base. Removal of the power line and fence and general upgrading of the area should be accomplished during construction.

(Mile 154 to 155)

A channel change extending 6000' from near mile 154 to 155 is now proposed in this section; however, near station 155 some problems are encountered The proposed channel would cross the railroad grade which has not been abandoned through this area. It then crosses a mine waste area for about 1000', perhaps a previous tailings pond, which is completely sterile and devoid of vegetation A new channel cut through this material could have serious detrimental effects on the river below this point by causing siltation, turbidity and a possible reduction in water quality.

An alternate solution which merits consideration is bridging the river at two locations near mile 155 The original channel could be retained and approximately 1500' of difficult channel change could be eliminated The present river channel through this section, although hardly pristine, is stable and there is considerable vegetation on the side slopes and banks Bridge costs admittedly are a major factor here but should be carefully weighed against the long range detrimental effects of the proposed channel change and the cost of stabilizing the banks of the new channel.

(Mile 158)

Within a 1000' section the proposed alignment, which is on about a 6 degree curve, crosses the Boulder River and passes under the existing railroad bridge. The railroad bridge must be lengthened to accommodate the roadway which is designed with a narrow median. Provision must also be made for a low grade access road roughly paralleling the Interstate. Preliminary plans show a bridge over the river but serious thought is being given to the use of a steel arch culvert for the river and a second culvert at a higher elevation to carry the low grade access road under the Interstate.

The impact on the natural environment in this area would be very high even with the utmost care in the design of the structures and control of construction activities. It is strongly recommended that the plan for use of a bridge vs. the use of culverts be carefully compared, since a bridge would help to mitigate some of the impact and also provide an undercrossing for the low grade access road.

Relocation of the Galena Gulch Interchange (Mile 160.5)

A full diamond interchange is now indicated at this location in order to provide access to Galena Gulch on the south and High Ore Creek on the north. This area appears to be a small outwash plain at the mouth of Galena Gulch. The river passes through it in a series of pleasant lazy meanders and there is considerable de-facto recreation use, primarily camping and fishing. Access is provided by the existing Galena Gulch road.

Construction of this interchange, with its resultant 3000' channel change paralleling U. S. 91, would cause extensive environmental impact to the stream. Most of the native vegetation would be lost and much of the de-facto camping area would be used up by the main roadway and the off-ramps.

At the present time the Average Daily Traffic (ADT) on the Galena Gulch road is 28 vehicles, and on the High Ore road it is 54. Estimated ADT in 1992 is 48 for the Galena Gulch road and 92 for High Ore. It is difficult to see how the extensive destruction of the natural environment which would result from the construction of an interchange in this location can be justified by these low traffic volumes.

This problem was recognized and four alternate solutions were prepared with the full diamond at Galena Gulch being alternate #1. Alternate #2 is a modification of the diamond Interchange at Galena to one with remote south-bound ramps. Alternate #3 is a full diamond at mile 159.5 which would require relocation of about 3500' of the Burlington-Northern Railroad. Alternate #4 is a three ramp interchange, with a remote ramp to provide the fourth traffic movement, at mile 159.5 which eliminates the need for relocation of the railroad. Alternates 3 and 4 require a frontage road to provide a connection to the existing High Ore road.

Alternate #4, the three ramp High Ore interchange, appears to have the lowest impact on the environment. The only channel change (700' at mile 158.8), would be required regardless of which alternate is used. With a three ramp interchange at High Ore only a simple grade separation would be required at Galena Gulch and two bridges at mile 160.2 would eliminate the need for channel changes. It may also be possible to lower the profile of the Interstate through this area and most, if not all, of the de-facto recreation use would be retained.

Admittedly, the three ramp interchange at High Ore is not as simple as the full diamond at Galena Gulch and careful signing would be required. Some of the movements are also out of direction, especially for eastbound travelers from Galena Gulch. However, the same out of direction movement would be required by westbound travelers from High Ore using an interchange at Galena Gulch. Since this interchange, regardless of where it is located, will be used principally by local traffic, the patterns of use would soon become routine even though certain movements may be somewhat circuitous. It is strongly recommended that the plan to move the interchange to the High Ore location at mile 159.5 be carefully considered.

Bernice Interchange (Mile 151)

The primary purpose of this interchange is to provide access to roads in the upper Boulder River area to the west which serve Deer Lodge National Forest, Deer Lodge Valley and U. S. Forest Service campgrounds, as well as private properties. An access road from the interchange is proposed running southerly along Bison Creek about 1-1/2 miles to the mouth of Bear Gulch for the use of fishermen, campers and others. An informal but defined and designated parking area should be provided at the end of the road. From this point a simple foot-trail could be provided for fishermen and hikers up Bison Creek as far as Shamrock Campground. This would open up more than three miles of Bison Creek for fishing and the parking area would provide a place for rockhounds, hunters and back-country hikers to leave their vehicles.

From the Bernice interchange easterly, nearly 3 miles of abandoned railroad grade could be used for pedestrian fishing access along both Bison Creek and Boulder River. Two foot bridges across the river would be required opposite Interstate mile 151.5. There were railroad bridges at these points previously and the heavy masonry abutments are still in place. They could be used for foot bridges with very little effort. Access to the railroad grade can be provided by a spur from the Bear Gulch access road and, again, an informal parking area should be defined and designated There are possibilities for developing additional de-facto uses in this triangular area between Bison Creek, the Boulder River and the interchange, but considerable clean-up would be required to make it more attractive, since this area contains a highway maintenance stock pile and the abandoned railroad grade.

Basin Interchange

A low grade access road would be provided from the town of Boulder to the Bernice Interchange within the interstate corridor This road would also serve as a stock driveway in the spring and fall for trailing cattle from ranches in the vicinity of Boulder to and from summer ranges in upper Boulder Valley. From the Bernice interchange easterly to the Basin interchange the Interstate lies between the access road and the river, thus cutting off any access to it. However, from the Basin interchange easterly to the High Ore (or Galena Gulch) interchange, about 4-1/2 miles, the access road would be adjacent to the river. By providing numerous small parking pull-outs along sections of the access road, wherever the topography would permit it, this road could furnish fishing access to this 4-1/2 mile segment of the river Access to the low grade road would be from the Basin or High Ore interchanges.

The Basin interchange would also provide access, via local roads and trails, to whatever de-facto use was made of the 4000 foot section of the river south of the town of Basin In addition to the town itself, this interchange would provide connections to the Cataract Road and other local roads lying north of the Interstate serving the general Cataract Creek and Basin Creek mining district.

High Ore (or Galena Gulch) Interchange

As previously discussed, an interchange at mile 159.5 (High Ore) and a grade separation structure to serve the Galena Gulch Road at mile 160.5 would permit continuation of the de-facto use which now takes place at the mouth of Galena Gulch. From the existing Galena Gulch Road a connection would also be provided to the low grade access road, which, again, would permit its use by fishermen along the Boulder River. Small parallel pullouts could be provided for vehicular parking.

From mile 161 to 162.5 the river will be in the median, making this 7000 foot section practically inaccessible to fishermen. This situation could be helped to some extent by providing parallel or pull-out parking areas along the low grade access road adjacent to the proposed highway bridges. Fishermen could park their vehicles, walk under the bridges and fish in the median. If necessary, simple trails could be constructed from the parking areas.

DE-JURE AND DE-FACTO RECREATION

De-jure or Regulated Use

Existing de-jure areas on the Basin Route are Elk Park and Shamrock Campgrounds, Bison Creek picnic area, a snowmobile course, a dog training ground and five vacation residences. The snowmobile course and dog training grounds will be unaffected; Bison Creek picnic area would be obliterated; the campgrounds would be reduced in size and lose their present access. The residence at Bison Creek picnic area and the one near mile 158.5 may have to be relocated and may also have to be relocated if new access roads are not justifiable.

The campgrounds and picnic area are operated by the U. S. Forest Service. Preliminary studies suggested that access be provided in conjunction with highway rest areas. The Forest Service seriously considered this at one time but has concluded that bona fide campers would be better served by expanding other campgrounds in this general area or constructing new ones. Since these are 4(f) lands, replacement is mandatory.

Assuming that the rest areas will still be constructed at these locations (they are needed and these are good sites), the question arises as to what will become of the campgrounds. They would probably no longer be attractive to local and weekend campers but they could well serve to provide overnight campsites for recreation travelers using the Interstate. The question of responsibility for operation and maintenance might be difficult to solve. Before dismantling them or obliterating the sites there would seem to be some merit in trying to work out a solution whereby they could be continued in use in some form.

De-facto or Unregulated Use

De-facto use on the Basin Route is related primarily to fishing, camping, and picnicking, although rock hounding, historic exploration and other activities also take place. Spontaneous recreation now occurs in many places along the road and adjacent areas where the shoulder is wide enough to park a vehicle. Along the Boulder River, and to a lesser extent along Bison Creek, there are numerous off-road streamside areas that are heavily used by campers and fishermen. Since roadside parking is not permitted on the Interstate, opportunities for this kind of use will be reduced. However, the impact can be mitigated to some extent by providing frontage roads and access roads from the interchanges and by other means discussed in the following paragraphs.

MITIGATING ADVERSE EFFECTS ON FISHERIES

The following suggestions are general in character and are not tied into specific locations The proposed channel changes are quite extensive and the extent to which some of the mitigating measures can be used, and where, can only be determined on the basis of the final designs.

- Study alignment, profile and cross sections carefully in critical sections. Many times changes and adjustments can be made that will reduce the amount of channel change required or lessen its severity.
- Use more bridge structures to avoid altering or disturbing the natural stream.
- Where culverts are required, consider using steel arch culverts wherever possible so that the natural streambed can be retained. Place culverts on a skew when necessary to retain the natural alignment of the stream. Many times this reduces the need for channel changes although longer culverts are usually required.
- Derrick placed, or even hand placed, rock toe walls a foot or two in height can be effective in controlling the spill of loose fill material along the edge of the stream. This can reduce soil erosion at the critical point and so help to control siltation and turbidity
- Consider the use of derrick placed dry rock retaining walls or gabions (rock filled wire baskets) where near vertical walls are required in tight or critical locations. After placing, topsoil can be thrown over them to encourage the growth of grasses and other small plants. Concrete walls, steel bin walls and blanket type rock riprap should be avoided on stream channel changes as they detract from the natural appearance of the stream and merely emphasize the fact that the channel has been changed.

- Where there is sufficient lateral space to do so, stream meanders should be incorporated into the channel changes to make them appear as natural as possible and to reduce the gradient. Side slope ratios should be variable. Avoid the canal-like appearance of channel changes cut to an exact template, primarily to facilitate the use of heavy equipment and to simplify the computation of quantities.
- The introduction of rock riffles or checks in the stream bed and random placed groups of large and small boulders will create eddies, currents and a certain amount of turbulence, much as it occurs under natural conditions. Replanting stream banks and other disturbed areas with native plant materials will also help to speed up naturalization of the channel changes.
- Apparently, in some locations, the water quality of the river is being degraded to some extent at the present time by minerals leaching from old mine dumps and tailings ponds. In conjunction with the construction of the Interstate, there may be opportunities, working with the Montana Fish and Game Department, to correct or at least alleviate some of the contamination resulting from the past bad practices

POTENTIAL IMPACT ON HISTORIC SITES AND STRUCTURES

The archeological and historical consultant's analysis of the Basin Route concluded that individually the old mining properties in the immediate corridor have little pure historic significance. However, he points out that the Basin-Cataract mining district does contain major properties that have some significance in preserving evidences of the history of mining in this region. Most of these properties would still be accessible via the interchanges at Bernice, Basin and High Ore-Galena Gulch

Within the actual construction corridor, none of the mines which would be directly affected appear to have a high degree of historic significance even at the local level, except as they are a part of the general mining scene" along U. S. 91. The Burlington-Northern Railroad trestle mentioned in the report will remain at least as long as the railroad is in operation, and numerous evidences of the mining activity in Boulder Valley will still remain, unaffected by the construction. The impact, therefore, on the historical resources within the construction zone is not considered significant.

SPECIAL CONSIDERATIONS AND TECHNIQUES

Over the years many ideas have been tried and many experiments have been conducted by state and federal road-building agencies, by the National Park Service and others to reduce the impact of road construction on the natural environment. Many innovations and techniques have resulted from these experiments; but to be effective they have to be built into the job and considered in the design stage Today equipment is so large and jobs move so fast that the decisions must generally be made before the job is bid. It is difficult and prohibitively costly now to come back and do a "cosmetic" job after the heavy construction has been completed. Some of the items which follow are applicable to this particular project; others are of a general nature

- On this job it is suggested that an effort be made to come out with a balanced job without additional excavation from the roadway prism. Preliminary figures indicate that excavation and embankment quantities are not too far out of balance; however, the cost for overhaul would probably be increased. In this environmentally sensitive area, the impact created by opening borrow pits or creating waste areas should be carefully weighed against additional overhaul costs.

- There are opportunities for upgrading the appearance of the roadsides as a part of this project, especially in the Basin area Should waste develop on this job it could be effectively used to blanket the sterile tailings ponds near the town of Basin. The area east of the Bernice interchange could also be upgraded by moving the present maintenance operations and grading out the piles of waste
- In establishing clearing lines, especially in forested areas such as upper Bison Creek, the appearance of a "wall" of trees along the clearing line should be avoided. This can be done by providing for additional selective cutting and thinning beyond the clearing limits and by marking, within the clearing limits, individual trees or groups of trees which are to remain
- Large rocks or boulders, found or developed within the construction zone, should be salvaged and stockpiled for use in dry rock retaining walls on selected cut or fill slopes, stream bank protection, toe-walls and for naturalizing channel changes.
- On cut slopes where natural rock outcrops occur, they should be left in place and exposed wherever feasible. They add interest to the scene and break up the mechanical appearance of the usual uniform slope

treatment

- Seeding and mulching of cut and fill slopes and other disturbed areas has become standard practice. In dry regions, or when this work must be done during the dry season, supplemental watering is often slighted, resulting in poor slope recovery. On this project, where the amenities are especially important, it is suggested that plenty of additional units of supplemental watering be set up to insure a good rate of recovery.
- It is estimated that several thousand head of cattle will be trailed along the low grade access road each spring and fall from Boulder to the Bernice interchange. On that section of the road from Boulder west to Basin there are several locations where it appears fencing will be required to protect and preserve the riverbank. This should be given careful study on the ground and adequate provisions included in the plans and specifications.
- One of the heaviest impacts on the environment throughout this project would be created by the extensive channel changes proposed on both Bison Creek and the Boulder River. It would appear justified, therefore, to go to some lengths to minimize the effects of these changes and to re-create a naturally functioning stream. This is a science and a person skilled in stream habitat restoration, working with the Montana Fish and Game Department personnel could obtain the desired results. It would take time and a small strictly supervised crew and a few key pieces of equipment, which might include a "cherry-picker" for handling and placing large boulders. It would require large

quantities of native plant material either from nurseries or transplanted locally Fortunately, there are sections of virgin river remaining which could be used as examples to guide the work. It is suggested that this approach be given some serious thought. It could be a separate contract with a generous time allowance for completion

CONSTRUCTION GUIDELINES FOR ENVIRONMENTAL IMPACT REDUCTION

The following items are included in the "Standard Specifications For Road and Bridge Construction" of the Montana Department of Highways or would be included as special provisions for the projects.

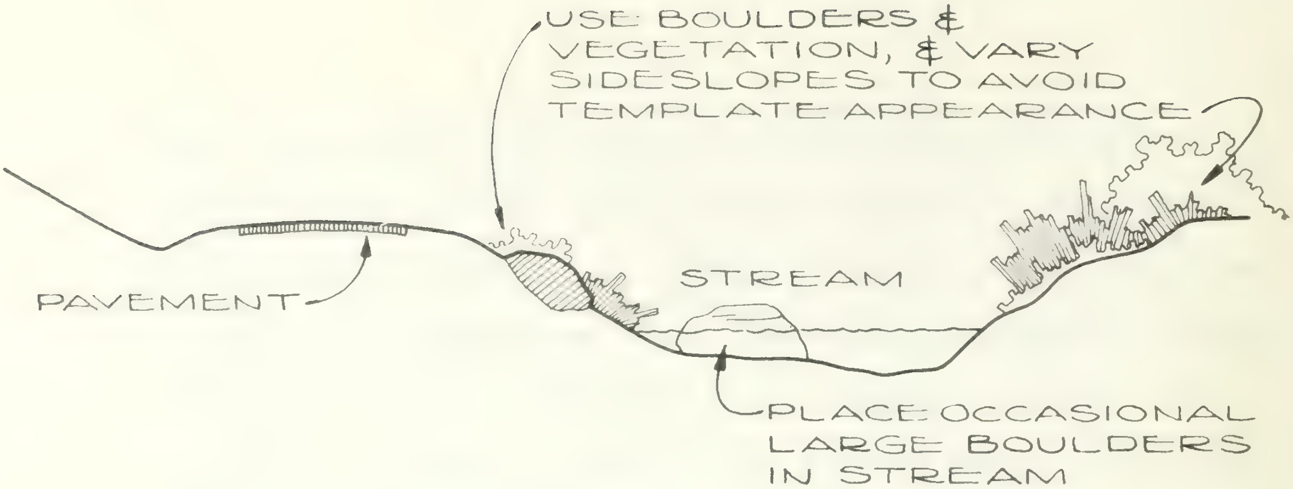
- Exercise care in the job stake-out to be sure that clearing limits and working limits are well defined and adhered to.
- Try to avoid the burning of slash and waste. Consider requiring the contractor to dispose of slash by chipping, using chips for mulching if applicable.
- Require stripping and stockpiling and topsoil for top dressing slopes and disturbed areas.
- The contractor's camp should be carefully located, have well defined limits and be completely cleaned up and obliterated at the end of the job.
- Borrow and waste areas, if required, should be screened if at all possible, perhaps located behind a hill or a screen of trees. Haul roads should be curved to avoid opening up a direct view of the operation. Pits should be carefully cleaned up, graded out, topsoiled and seeded when no longer needed.

- Blasting operations should be carefully monitored to prevent overloading of shots. Blasting mats should be required if necessary in sensitive areas to control the scatter. Thorough and complete cleanup should be required of any damage resulting from blasting operations. If there are natural features such as outstanding or unusual rock formations, specimen trees, etc., which might be damaged, special protective measures will be required.
- Require the contractor to operate equipment within the construction zone to the fullest extent possible and penalize flagrant violations. Where operations require turning movements outside the construction zone, specific locations should be designated. When not in use, insist that equipment be parked in the construction zone or in a designated area. Much unnecessary damage to vegetation can be avoided if these simple requirements are enforced.
- The final cleanup inspection should be thorough and it should be done before the contractor has removed all of his equipment. It is very difficult to get supplemental cleanup work done if there is no equipment left on the job.

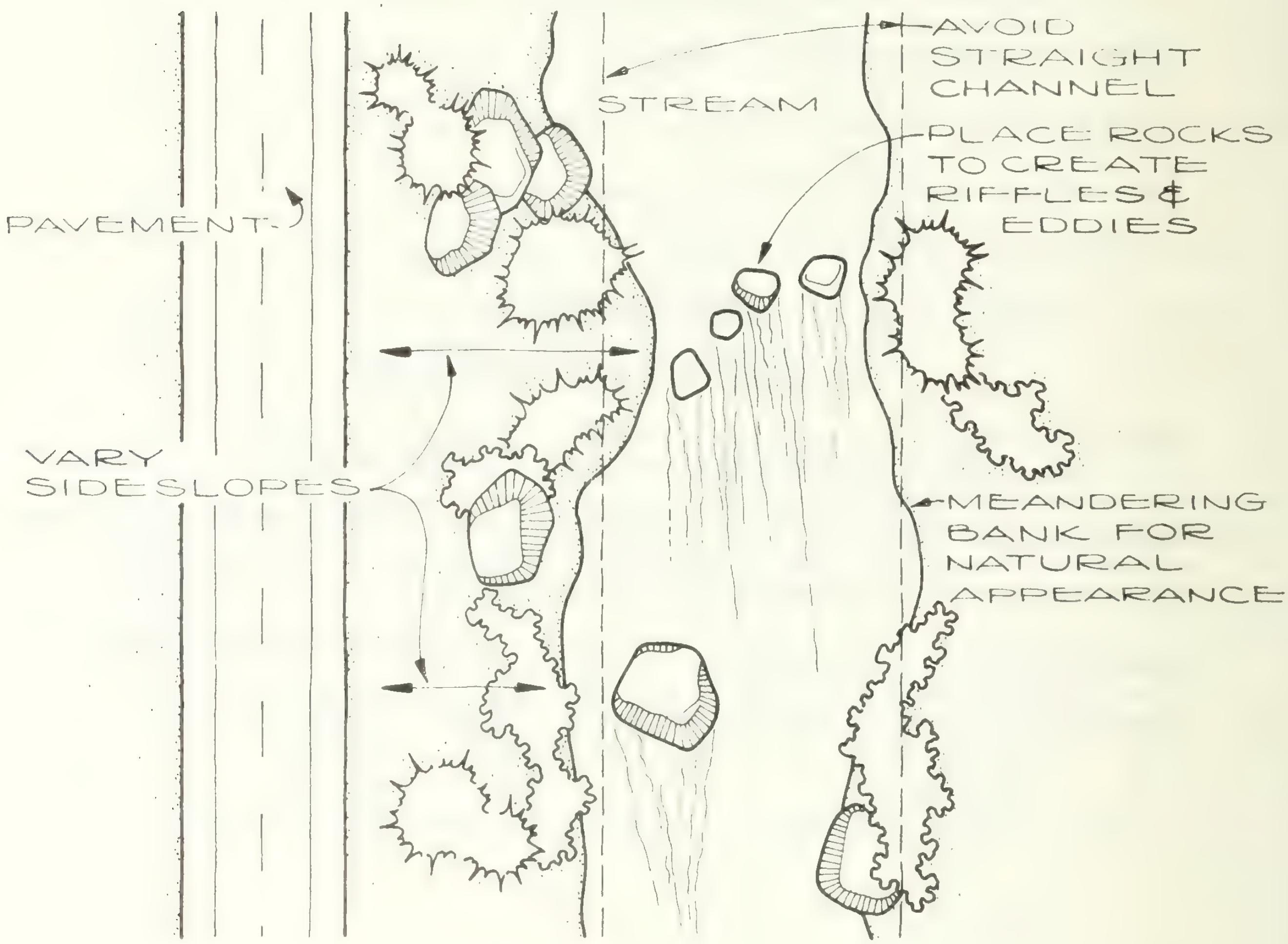
It will be necessary to make detailed analysis of each location and recommendation to adequately evaluate the costs versus benefits gained. No costs are included for the improvement measures recommended in this section.

DESIGN IMPROVEMENTS
FOR ENVIRONMENTAL IMPACT REDUCTION

The Phase I environmental analysis pointed out that construction of the Basin alternate would result in significant impact on the natural environment Implementation of the "Special Considerations and Techniques" presented in the preceding pages would substantially reduce the adverse effects The following sketches serve to illustrate some of the proposed recommendations


USE BOULDERS & VEGETATION, & VARY SIDESLOPES TO AVOID TEMPLATE APPEARANCE
PAVEMENT
STREAM
PLACE OCCASIONAL LARGE BOULDERS IN STREAM

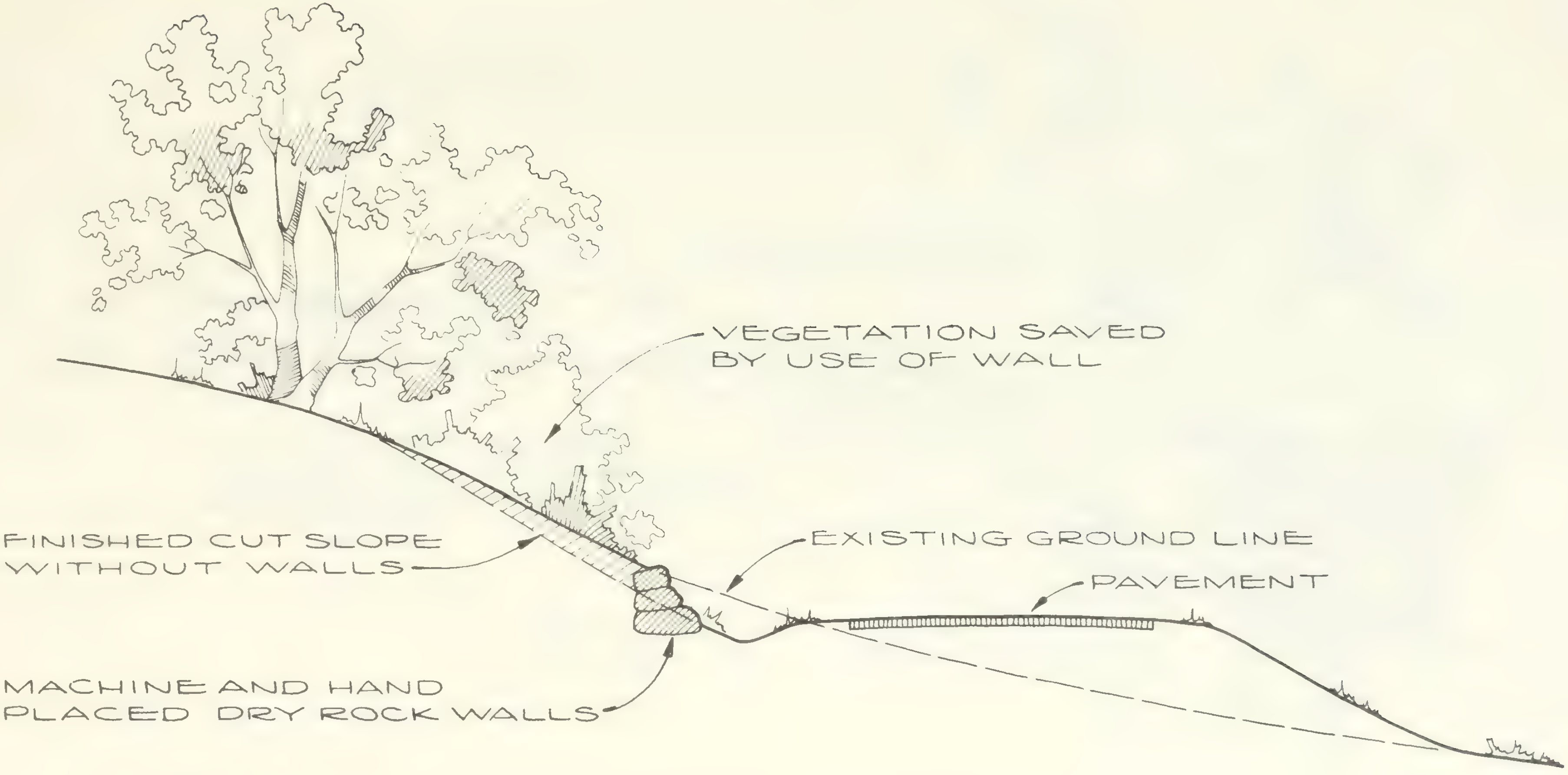
SECTION


AVOID STRAIGHT CHANNEL
STREAM
PLACE ROCKS TO CREATE RIFFLES & EDDIES
PAVEMENT
VARY SIDESLOPES
MEANDERING BANK FOR NATURAL APPEARANCE

PLAN

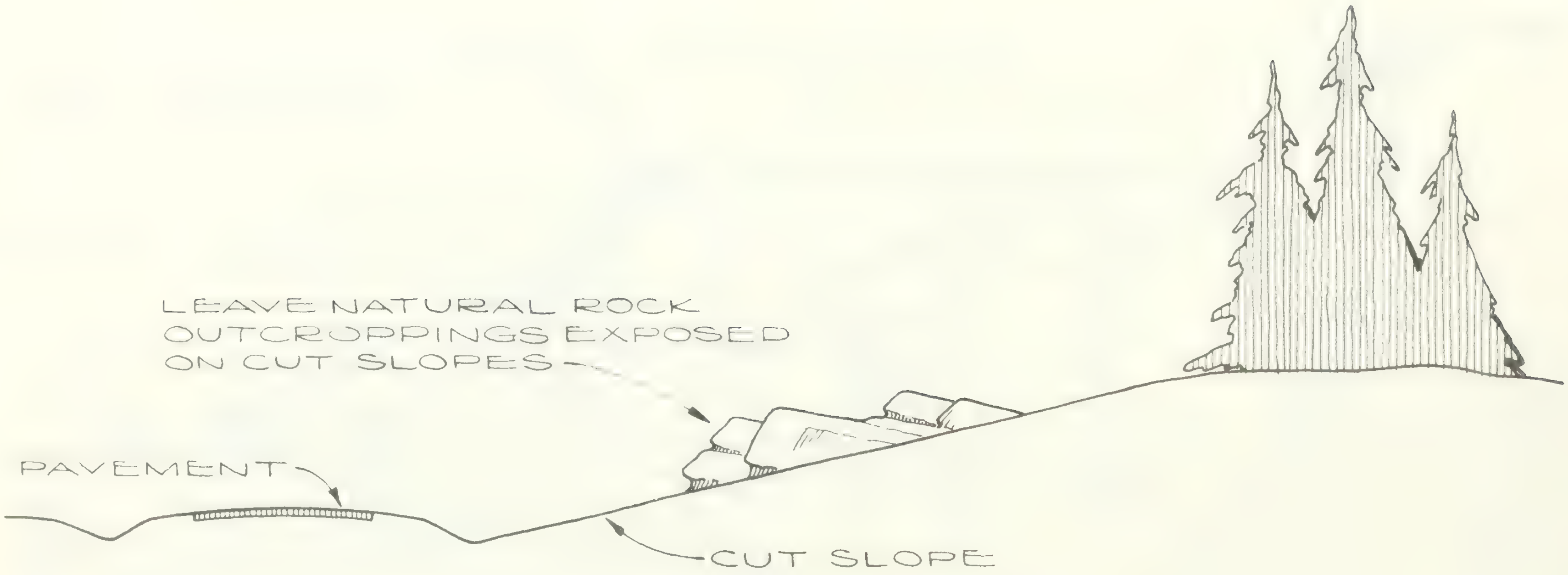
CHANNEL CHANGE METHOD

FIGURE 20



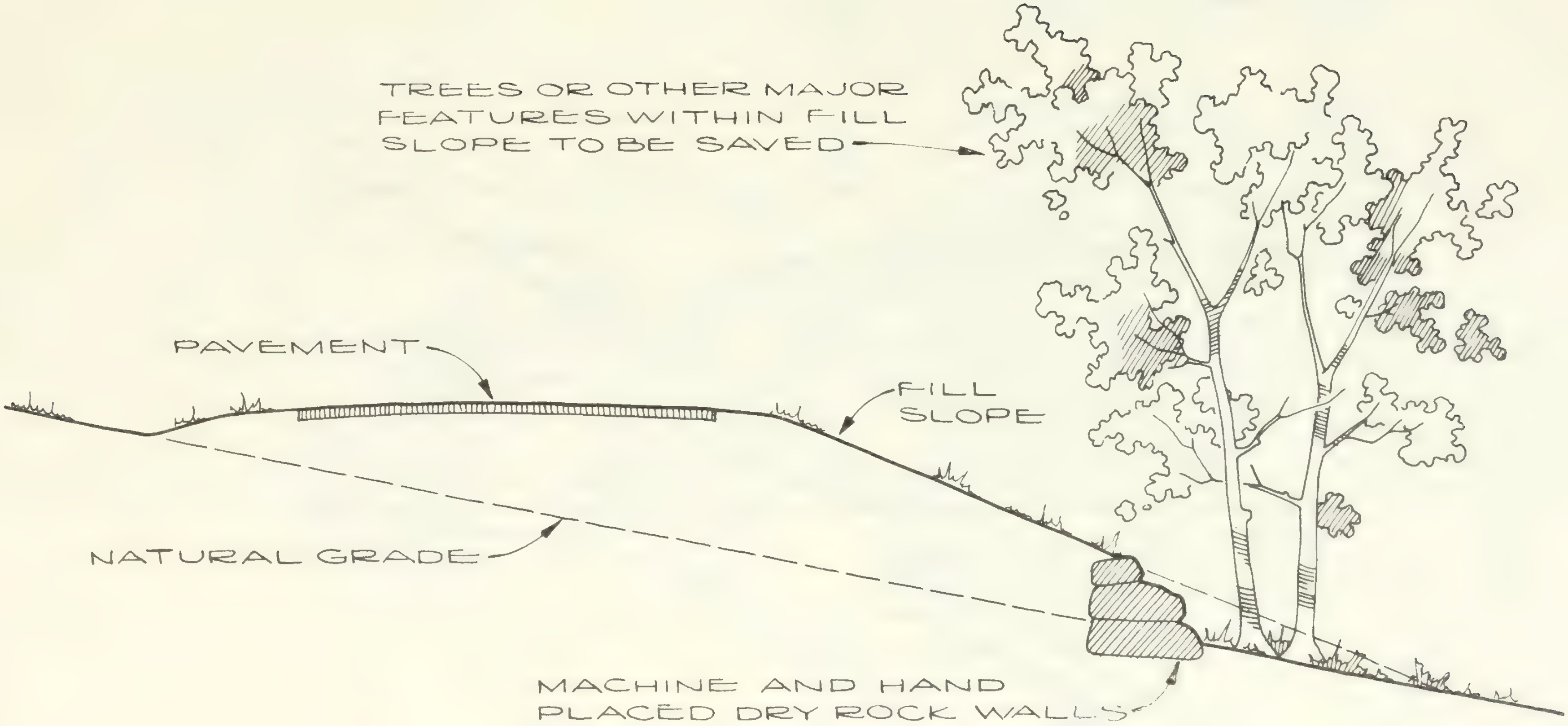
**RETAINING WALL
TO PRESERVE LANDSCAPE FEATURE**

FIGURE 21



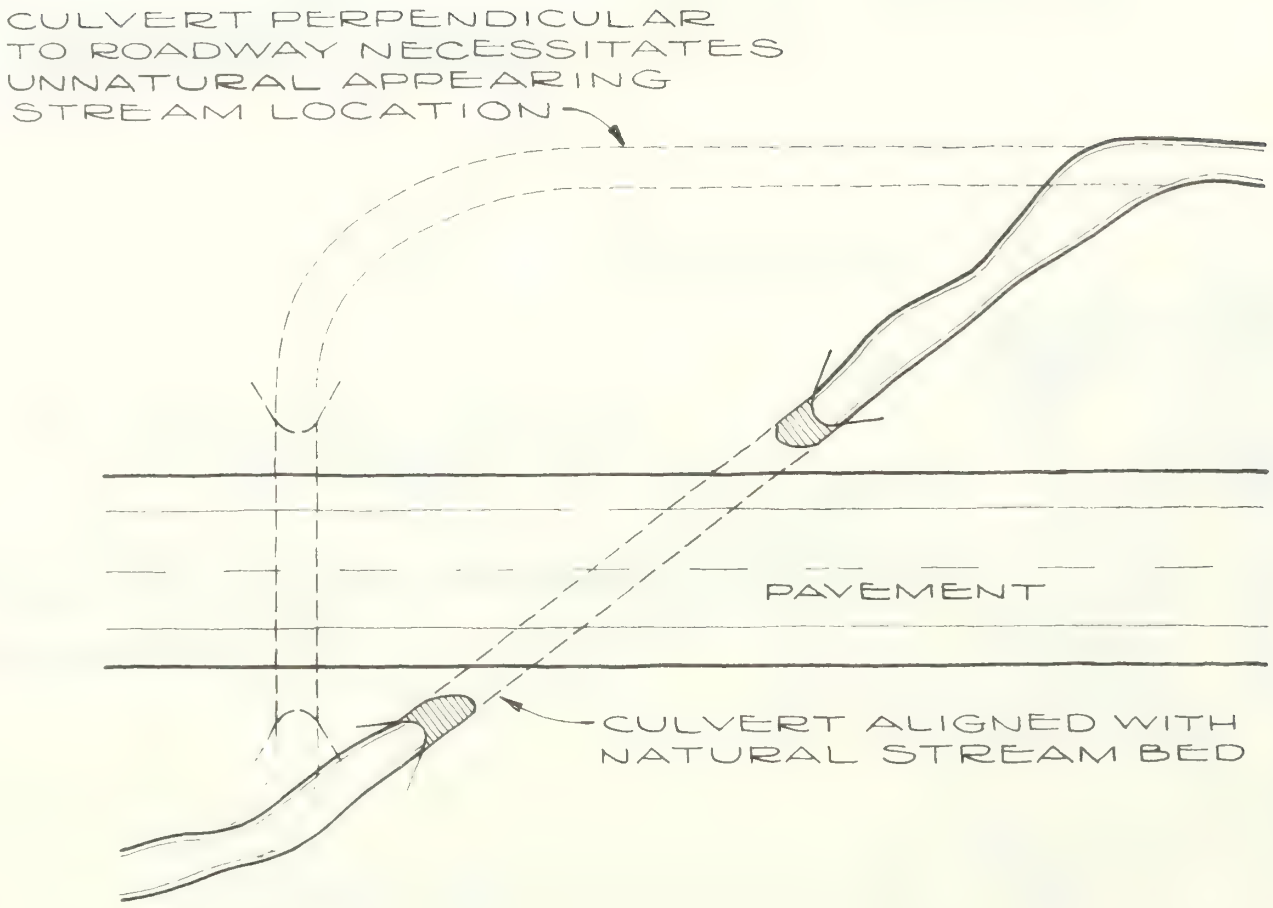
OUTCROPPING PRESERVATION

FIGURE 22


TREES OR OTHER MAJOR FEATURES WITHIN FILL SLOPE TO BE SAVED
PAVEMENT
FILL SLOPE
NATURAL GRADE
MACHINE AND HAND PLACED DRY ROCK WALLS

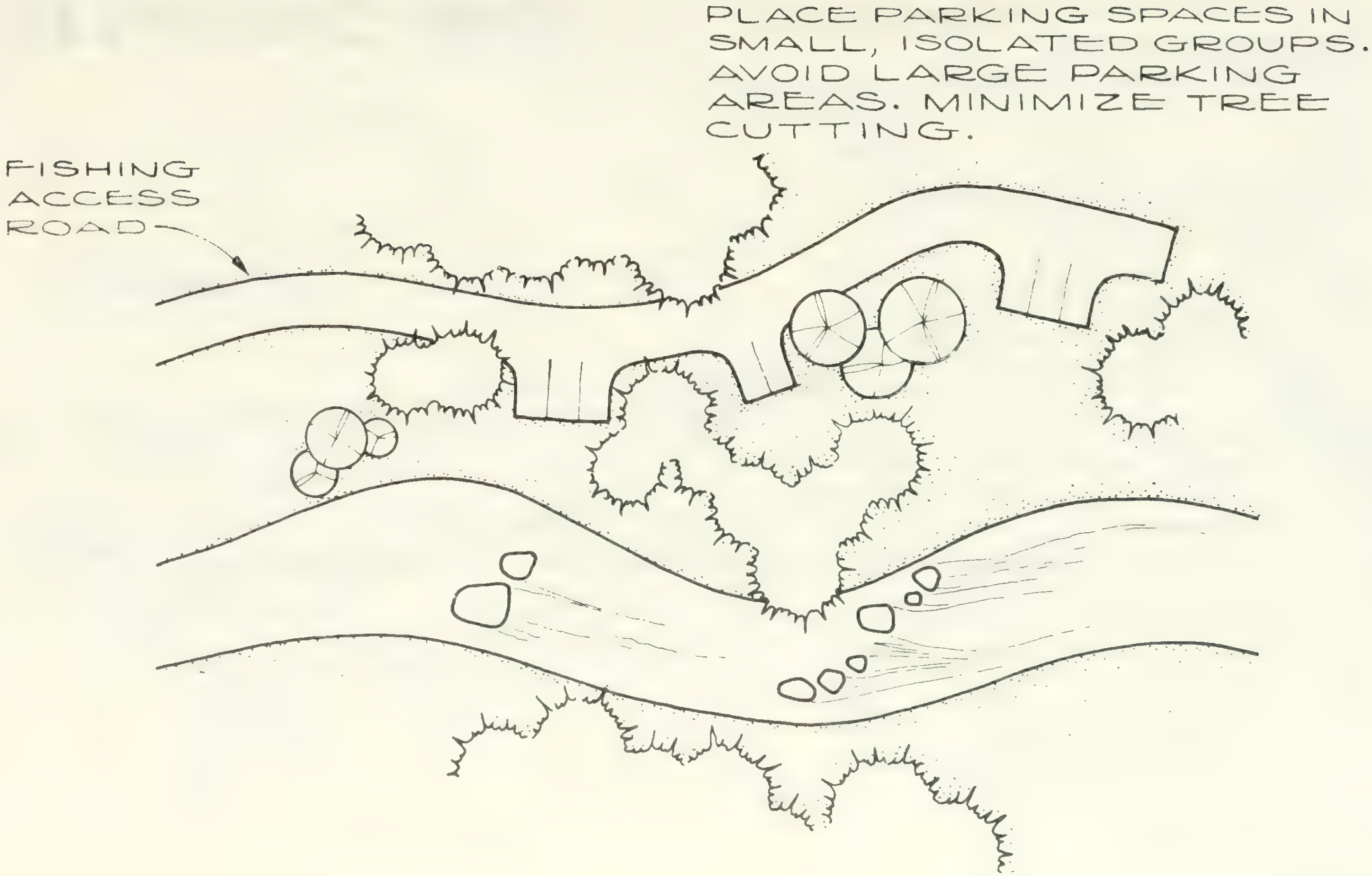
**RETAINING WALL
TO PRESERVE LANDSCAPE FEATURE**

FIGURE 23



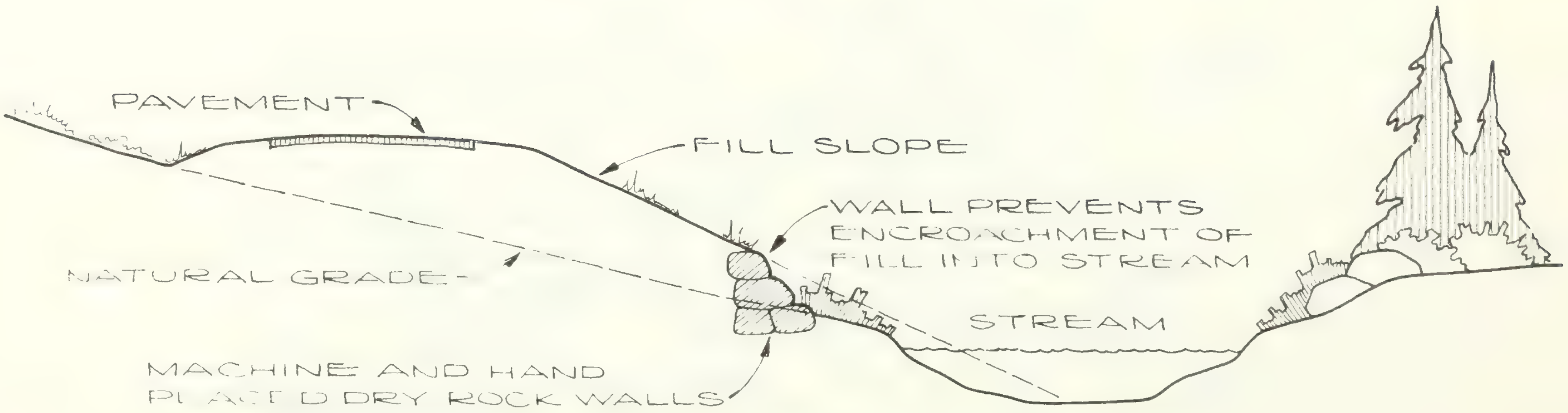
PREFERRED CULVERT ALIGNMENT

FIGURE 24


PLACE PARKING SPACES IN SMALL, ISOLATED GROUPS. AVOID LARGE PARKING AREAS. MINIMIZE TREE CUTTING.
FISHING ACCESS ROAD

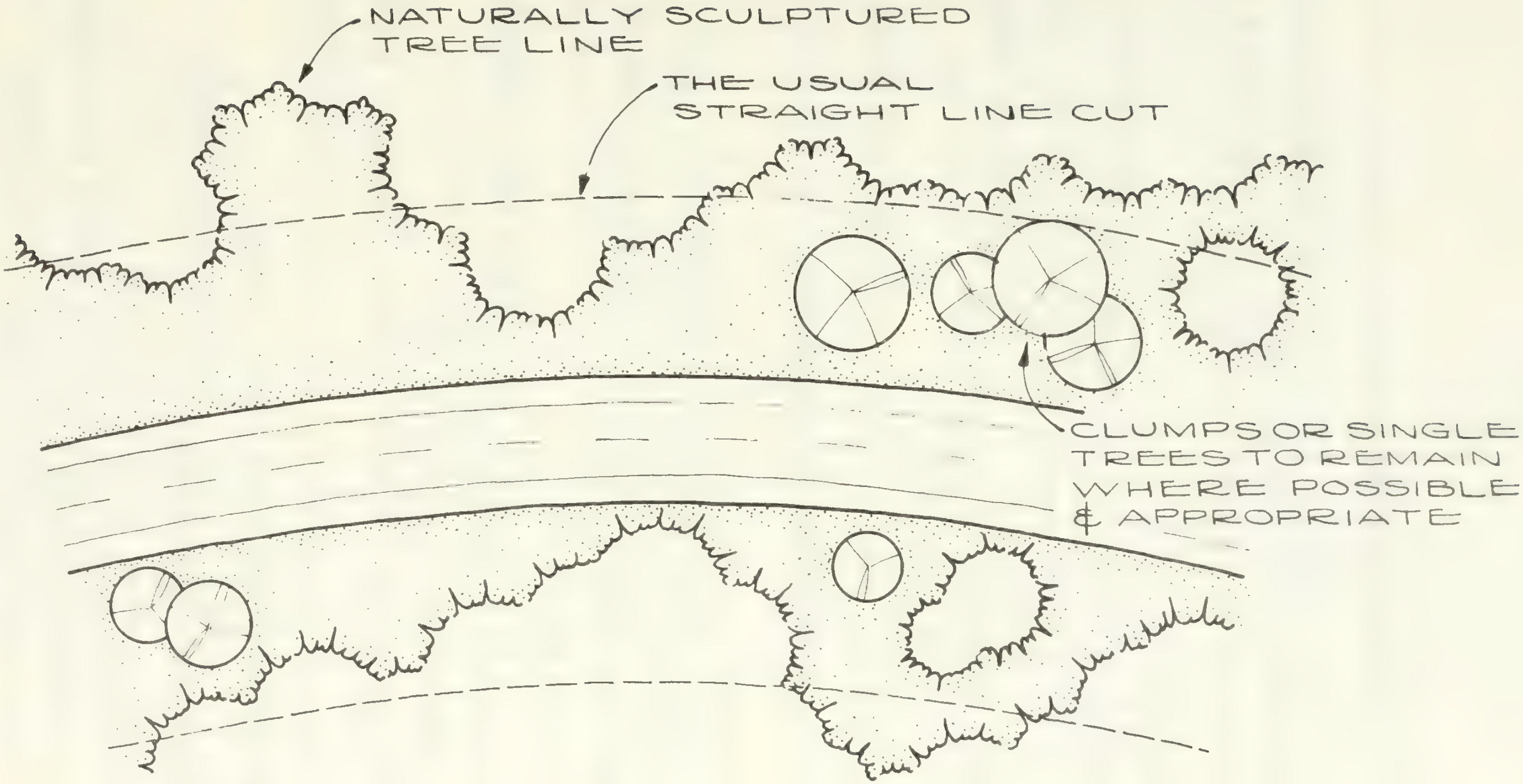
DISPERSED PARKING METHOD

FIGURE 25



RETAINING WALL
TO PRESERVE LANDSCAPE FEATURE

FIGURE 26


NATURALLY SCULPTURED TREE LINE
THE USUAL STRAIGHT LINE CUT
CLUMPS OR SINGLE TREES TO REMAIN WHERE POSSIBLE & APPROPRIATE

TREE LINE
SCULPTURING ALONG R.O.W.

FIGURE 27

EFFORTS TO MINIMIZE HARM

Relocation assistance to displaced families and businesses and access to communities and areas used by the public are measures used to minimize harm in the Socio-Economic field.

No realignment of railroads is expected and relocation of utility features can be accomplished with a minimum disruption of service. The taking of the minimum required amounts of right-of-way will minimize the impact to the tax base and the conduct of government.

Reduction of harmful effects to historical features will be accomplished by careful alignment studies to reduce encroachment and the provision of access to other sites.

The harmful effects of air pollution from construction operations will be controlled by existing regulations enforced by the Montana Board of Health and Environmental Sciences and others.

Water quality will be preserved to the greatest extent feasible as described in "Water Quality" Phase II of this report.

The "Possible Modification of Design Details" in Phase II of this report considers in detail the possible efforts to minimize harm resulting from construction of the proposed facility.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Access to mining resources close to the roadway prism will in a few instances be lost. It was not determined what the mineral value of these properties is but none of the sites affected are presently being worked.

About 680 acres of agricultural type lands, 56 acres of mining claims, 4 acres of residential, 4 acres of industrial and 449 acres of unclassified land will be required for construction purposes

A minor amount of damage will be done to historical sites of local significance - mostly mines.

Other resources which will be lost for future use will be mineral aggregates and other construction materials and fuels which will be used in constructing the facility

A small amount of timber resources would be lost but any merchantable timber would be salvaged.

IMPACT ON THE ENVIRONMENT

In the socio-economic field the principal impact will be the relocation of families as discussed in Section V, Socio-Economic Study and restriction of access to public lands along the route Beneficial impact on Butte, the largest city in the area, would result.

"Design Features" and "Possible Modifications of Design Details" in Phase II of this report list all the major items of impact due to construction of the facility.

ENVIRONMENTAL DAMAGE WHICH CANNOT BE AVOIDED

Roadway construction will create cut and fill slopes and will cause a considerable amount of stream alteration as covered in the "Stream Channel Studies" section in this report. Damage to agricultural land will occur as covered in Section V, Socio-Economic Study

Temporary damage to water quality will occur and increased noise and air pollution will temporarily be present.

ALTERNATIVE ACTIONS AVAILABLE

The alternative actions which are available to reduce impact along the Basin Route are: 1) construct the Interstate route along another corridor; 2) do not build an Interstate route between these two common points.

Neither of these alternatives appear to be reasonably acceptable. Phase I of this report was a detailed study to determine the most desirable alternate route to be used for the construction of I-15. The results of this study indicate that the Basin Route is the most desirable and feasible. It would, therefore, be inconsistent with the findings of that Phase of the study to select a different route for this Interstate project.

The second reason appears to be equally unacceptable. This section of I-15 is an important link in the nation's network of Interstate and Defense highways. A no-build alternate would therefore be inconsistent with the intent of the National Interstate and Defense Highway Systems Act.

RELATION BETWEEN SHORT TERM USE AND LONG TERM PRODUCTIVITY

The amounts of timber, agriculture and mining resources which would be taken out of production would not have a significant effect on the long term productivity of the area.

The benefits provided by the more efficient transportation system far outweigh the minor damages incurred by the small area reduction of productive resources.

SUMMARY OF FINDINGS & CONCLUSIONS - PHASE II

The results of the Phase II evaluation to investigate possible ways to minimize harm to the environment were accomplished by examination of specific areas along the Basin Route which had been identified as sites which potentially created adverse impact. Specific recommendations were made to lessen the impact but actual implementation of many of these features will depend on expanded details and cost considerations which can only be determined during the design phase of the highway development. It should be recognized that many of these items could increase construction costs. No added costs are included for these measures because similar increases would be incurred on any alternate which was considered in more detail. Also, it cannot be determined at this time how many of the items would actually be economically justifiable nor which items would be approved by the decision making agencies.

Examples of items which could incur comparable additional costs on the other alternates if considered in greater detail would be access costs including the possible need for new interchanges, vehicular or stock underpasses or more extensive frontage and access road systems. Other measures used to mitigate impact and which would incur added costs might include special treatments for game crossings such as high fences used in conjunction with overpasses or underpasses and of course the grade separation structures themselves. Other adaptations for unique features which do not yet exist and that may or may not be planned and materialize could also increase costs. An example is the specific location and required provisions for the Interstate to cross on the top of the proposed Soils Conservation Service dam or for realignment to be completely downstream on the Whitetail Route about two miles south of Boulder.

The environmental impact for the Basin Route as shown in Phase I would be substantially reduced by implementation of the recommendations included in Phase II of this report.

APPENDIX TO PHASE II

IMPACT OF THE PROPOSED ACTION

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DEERLODGE NATIONAL FOREST
BUTTE MONTANA 59701

August 23, 1973

ADDRESS REPLY TO
FOREST SUPERVISOR
AND REFER TO

7700
Interstate - 15

Mr. H. J. Anderson
Director of Highways
Department of Highways
Helena, Montana 59601

Dear Mr. Anderson,

I have your letter of August 15, 1973 in which you ask a number of questions about the encroachment of proposed Interstate 15 on National Forest lands on the Deerlodge Forest.

The three campgrounds on the proposed Basin-Butte route, - Shamrock, Bison Creek and Elk Park, are of local significance. They are used by local people and people traveling through, but are not significant nationally or regionally as irreplaceable.

The Nez Perce route would encroach on Elder Campground. This campground is of local significance only.

The Whitetail route does not encroach on any recreational sites.

All of these campgrounds are typical so that their full replacement is a matter of reconstruction. In the case of the three on the Basin-Butte route, they could be replaced at Cinderella, or at any of the three sites on the North Boulder River at Morman, Ladysmith, and Whitehouse. Any of the above two options would be beneficial.

A relocation of Elder Creek, were the Nez Perce route chosen, could be made at one of the above locations, or a new location closer to the town of Boulder.

If you have any further questions, please keep in touch.

AUG 24 1973

Sincerely,

For GEORGE M. SMITH
Forest Supervisor

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DEERLODGE NATIONAL FOREST
BUTTE, MONTANA 59701

ADDRESS REPLY TO
FOREST SUPERVISOR
AND REFER TO

MONTANA HIGHWAY COMMISSION
RECEIVED
MAR 23 1973
HELENA, MONTANA

March 21, 1973

2360

H. F. Anderson
Director of Highways
Montana Highway Department
Helena, MT 59601

Dear Mr. Anderson:

Please refer to your letter of February 22, 1973.

You have asked us to give you proposals concerning campground replacements, assuming Interstate 15 will be routed through Basin and Elk Park to Butte.

Several years ago, we explored with your department, the possibilities of joint development of rest areas and campgrounds at the Shamrock and Elk Park campgrounds. Since that time we have explored other options in more detail. This has required a new look at all proposals. We feel that joint development with combination rest areas-campgrounds, may not be the best way to serve the public which uses the National Forests. We therefore feel that joint development should no longer be considered an option.

Construction of a highway on the general route that has been proposed through Basin would either destroy three campgrounds or at least render them unusable. Therefore we have three possibilities that we need to look at further.

1. Develop a new campground, to replace the present three campgrounds, in one location at the Cinderella site which is in Section 18, T.4 N., R.6 W. This location is about one mile from the proposed Trask Interchange.

2. Develop a new site at some location near the Interchange which we have not had time to examine in detail.

3. Develop additional units at Morman, Ladysmith, and Whitehouse, along the North Boulder River road west of Bernice.

This letter gives consent to take these campgrounds if necessary for Interstate 15 construction provided that replacement or payment for the destroyed units is made.

I am sorry that we cannot be more positive in the location of replacement units but we have not had the time to make the final determination. I hope this will satisfy your requirements for the 4-F statement in the environmental report. If not, please do not hesitate to write or call me or Bernie.

Sincerely,

George M. Smith

GEORGE M. SMITH
Forest Supervisor

Date Recd. Preconst. 3-26-73
MAIL ROUTE
Act
Info
Attach
Initial
SCK
31 Contract Plans
32 Loc. [illegible]
33 [illegible]

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DEERLODGE NATIONAL FOREST
Butte, Montana 59701
July 19, 1973
2300

JUL 23 1973
FILE
Proj
Util.

Montana State Highway Department
Rights-of-Way Division
Helena, MT 59601

ATTENTION: Bob Champion

Dear Mr. Champion:

On June 27, 1973 we met with people from the Montana Highway Department, the Federal Department of Transportation, Bureau of Outdoor Recreation, and a representative from Morrison Maierle, at Basin, Montana. The purpose of the meeting was to look at the campgrounds on the proposed Basin-Butte Route for I-15 that would be affected if the Interstate was built on that route. The campgrounds affected would be Shamrock, Bison, and Elk Park.

The group looked at the possibility for 4F replacements along the North Boulder River at Mormon, Ladysmith, and Whitehouse. We also looked at what is known as Cinderella in the SW of Sec. 18, T.4 N., R.6 West, just off the Trask siding.

For purposes of the Highway Department's environmental statement, we would propose that Cinderella would be the tentative location where we would put the 4F replacements.

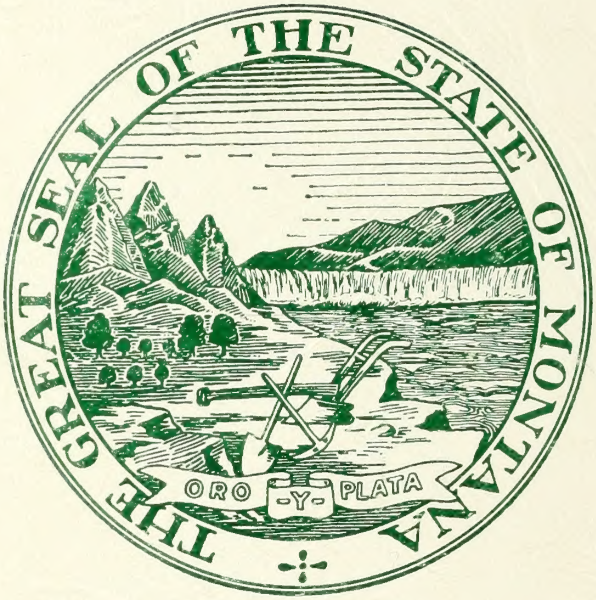
We have not gone through any public involvement in connection with this proposal and we will not do any until the final route is selected by the Highway Commissioners. When the final selection is made, we will than do the necessary public involvement which could result in a change of location. If this occurs, then we would have to find a new location for the replacement which would meet our needs.

I trust this letter meets your needs for preparation of the environmental statement. If not, please feel free to write or call.

Sincerely,

George M. Smith

GEORGE M. SMITH
Forest Supervisor


THE GREAT SEAL OF THE STATE OF MONTANA
ORO Y PLATA